

Arterial Disorders

Peripheral Ischemia

Definition:

Impairment of blood supply to the tissues sufficient to impair their nutrition and function.

Types:

- 1- Acute ischemia.
- 2- Chronic ischemia.

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The effects of ischemia depend upon:

- 1- The type of the artery: Some arteries have a very efficient collateral circulation to the extent that their ligation may not be followed by serious sequelae, e.g. the subclavian artery. On the other hand, the brachial and popliteal arteries have poor collateral circulation.
- 2- The rate of occlusion of the artery: Acute ischemia is much more serious than chronic ischemia as there is no sufficient time for the collateral to develop. تكون في ساعات
- 3- The state of the collateral vessels
- 4- The general condition of the patient: The presence of myocardial insufficiency or severe anemia will exacerbate the effects of ischemia. moderate ischemia ← Severe ischemia لوصحته Anemia يتحول
- 5- Efficiency of treatment.

Acute limb ischemia

Definition:

This serious condition is due to sudden interference with the blood flow to a limb.

Etiology:

- 1- Embolism is the commonest cause.

- 2- Causes in the wall:

- a. Arterial injury.
- b. Acute thrombosis on top of atherosclerosis.
- c. Vasospastic disorders leading to sudden vasoconstriction as in Raynaud's disease.
- d. Intra-arterial thiopentone or cytotoxic substances. induction of general anaesthesia Antecubital vein بدل artery لواتحقن في → Acute ischemia
- e. As a complication of aortic dissection.

- 3- Compression of the artery by: plaster of paris, hematoma, tourniquet, fractured bone.

- 4- Phlegmasia alba dolens.

Clinical picture:

- 1- Type of patient e.g. history of cardiac disease (embolism) or trauma.
- 2- Pain is usually sudden and severe and occurs in 80 % of cases. Pain is absent in some patients because of the rapid onset of anesthesia. Proceeds → Pain
- 3- Pallor appears first but is replaced by mottled cyanosis after few hours due to the accumulation of deoxygenated blood.
- 4- Paresis passing to paralysis may occur. Paraplegia may be the first presentation of aortic bifurcation embolism.
- 5- Paresthesia: Cutaneous hyposthesia progresses slowly to frank anesthesia.
- 6- Pulselessness.
- 7- Coldness.

Pulse نحسب Paralysis

لحياتك : أعيان

VISIT...

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Written → Acute ~~aneurys~~ ischemia
→ aneurysm

embolism
Indury

مهم جدا جدا

Gangrene → مش قوی

Clinical → Chronic ischemia
→ Arteritis

Tars → Aneurysm
→ Atherosclerosis of Aorta

Anatomy

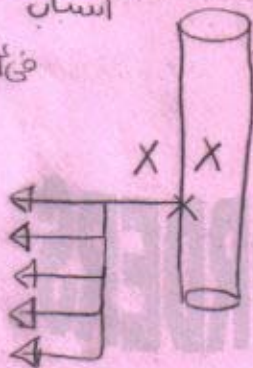
Operative → ttt of acute ischemia
→ ttt of Arterial indury

X ray Angiography

Obstruction
Tube

انسداد

Congenital
Traumatic
Inflammatory
Neoplastic
Miscellaneous



یمنطبق علی

esophagus

Pylorus

Common bile duct

Intestine

Ureter

Artery → congenital

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Irreversible lower limb ischemia:

1. Fixed color changes "blue staining." → limb أزرق → loss of capillary circulation
2. Signs caused by muscle "necrosis"
 - a. Tense calf. Sign
 - b. Fixed plantar flexion of the foot.
 - c. Bulging anterior leg compartment.
3. Acute paraplegia may occur in case of saddle aortic embolism.



Moderate limb ischemia: It occurs if:

1. Embolus does not cause complete occlusion.
2. Pre-existing good collaterals in cases of thrombosis.

The onset is more gradual and the symptoms are less severe.

Sequelae: (complication)

The sequelae of acute limb ischemia will depend upon the factors mentioned before (Mention them)

Pathological sequelae:

- 1- **Secondary thrombosis**, which extends proximally as far as the nearest branch and distally in the arterial tree including the collaterals.
- 2- **Muscle compression syndrome**: Muscle edema that results from prolonged ischemia obstructs the circulation in the already ischemic limb. Further edema of the muscles that occurs following revascularization obstructs the circulation more and more.
- 3- **DVT** to stagnation of blood in veins draining the limb. الدم الراج قليل ← الراج قليل
- 4- **Moist gangrene**: line of demarcation is several inches below the level of arterial obstruction.

Clinical sequelae:

- 1- **Complete recovery**: if efficient treatment initiated rapidly. عرها متخفد لوحدها
- 2- **Moist gangrene**: line of demarcation is several inches below the level of arterial obstruction.
- 3- **Picture of chronic ischemia**. good collateral
- 4- **Volkmann's ischemic contractures** (see orthopedics). not effective
- 5- **Peripheral edema**: Post-revascularization edema can be due to widespread deep vein thrombosis.

Investigations for acute ischemia: should be urgent:

Imaging studies

1. **Duplex scan** localizes and identifies the presence of embolism or a thrombus.
2. **Arteriography** may cause a delay of 2 – 3 hours, therefore, not done in a threatened limb. Its value is in cases of diagnosed acute thrombosis because it provides information that is essential before doing an arterial reconstruction. This information includes:
 - Site of occlusion.
 - Proximal inflow, i.e., if there is another proximal arterial narrowing.
 - Flow distal to the occlusion, i.e., distal run-off.
3. **ECG & Echocardiography** detects cardiac sources of embolism.

Laboratory studies:

- Hemoglobin, urea and Creatinine.
- Acidosis and raised creatine phosphokinase and Leucocytosis WBC's indicate extensive muscle necrosis.

70% → Lower Limb emboli

70% L.L → bifurcation of Common femoral

Aorta
 Carotid
 Subclavian
 ← نطلع من heart نقسني مع
 ايه اللي يخليها تروح

bifurcation
 حلقة Aorta ايه اللي بوقفها
 في Lumen !!!

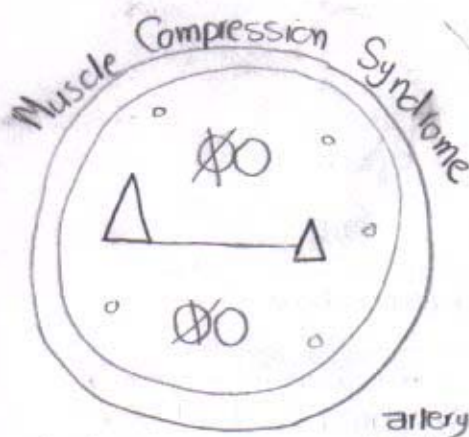
* embolism ← Acute ischemia لوجاله عيان

أحوله ← القصر العيني
 Vascular

← X immediate heparinization واعل

extension
 thrombosis

كان حسيب وهو في الاستقبال مبيستناش العيان لا ينزل من الاسعاف
 وهو حوه يحضر السرجة Heparin ويرميها في الهوا تلق
 وتروح للعيان وهم بينزلوه من العريية
 دلوقت صعب تعملوها.. بقت الأوضة فيواخته لافة
 لومخلصن السرجة تلق في الهوا ع لفان مش هتوصل



Acute ischemia ← انتقل
 ↓
 muscle edema مش عنية
 ↓
 collaterals قفلت
 ↓
 Acute ischemia أسرع



يزيد الطين بلة
 لو العيان حاله DVT
 دم يروح مش عايز يرجع edema
 Bad Follow up
 في ناس في القصر العيني
 Routine
 Routine مش
 Fasciotomy نعمله
 ↑
 Acute ischemia

Artery embolotomy
 ①
 سلك

عنه VD عني
 → الدم يلا فراغات واسعة
 → edema عنية
 → main vessel تقفل

Arterial Embolism (Embolic Ischemia & Gangrene)

Definition:

Embolism is a condition in which an embolus is circulating in blood stream & finally impacted in an artery.

Embolus is derived from the Greek word that means Plug or stopper. قلم

Incidence:

Usually in a Heart disease with congenital, rheumatic heart disease, infarction or artificial valve.

Pathology:

A- Source of arterial embolism: 90 % from the heart

1. From the left atrium as in A.F
2. From the mitral or aortic valve as in S.B.E.
3. From mural thrombus in myocardial infarction.
4. From mural thrombus in an aortic aneurysm.
5. From an atheromatous plaque or thrombus adherent in the aorta or large arteries.
6. Rarely paradoxical embolism may occur in case of A.S.D. or V.S.D.

B- Site of impaction of an embolus:

The embolus may be arrested anywhere as the vessel abruptly diminishes in size especially at:

- a- Bifurcation of common femoral artery into superficial and deep femoral arteries (40 %).
- b- The aortic bifurcation (**saddle embolus**)
- c- The bifurcation of the popliteal artery.
- d- The bifurcation of the brachial artery.
- e- The bifurcation of the common carotid artery.

C- Pathological sequelae: (see before)

Usually results in **gangrene**, Due to

1. **Secondary thrombosis**, which extends proximally as far as the nearest branch and distally in the arterial tree including the collaterals.
2. **Extensive venous thrombosis**, which aggravates edema and ischemia.
3. **Reflex spasm** of the vessels and the collaterals.
- ④ **Showers of emboli** may block the collaterals.
5. **The associated heart disease.**

Clinical picture: (see general)

Investigations:

E.C.G., Echocardiography and duplex scanning

General condition ③
مطوب ← أسد
Cardiac Patient ← embolus

لوعالجته تقع عليه قصرية زرع
وهو خارج عن المستشفى
يموت
متعالج هوش

هيمون من غير الموضوع ده

Paradoxical ← عيان نحس

DVT عيان عنده

Eisenmenger وللحظ عنده

اللى هو أصلاً نادر

شوية دم صغيرين بيروحو Lt vent

معظم الدم يروح Lung

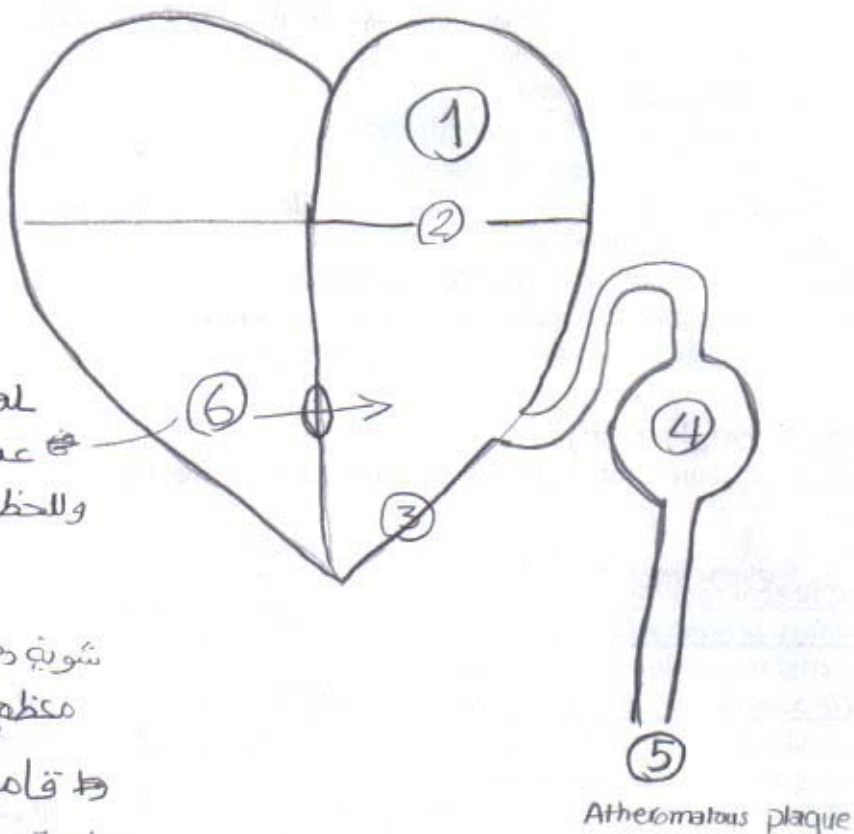
وط قامة embolus تشنق

شوية ال blood اللى هتدعى

VSD ال

Asymptomatic معظمهم

Symptomatic المنحوسه



ليه بنفرك thrombotic و embolic

embolic → embolectomy

thrombotic → thrombectomy
+ reconstruction of arterial tree
Chronic ischemia زي

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D.D.:

Embolic from ischemic:

	Acute + Source	Acute on top of Chronic
	Embolic ischemia	Thrombotic ischemia
Age	Commoner in <u>young age</u>	Commoner in <u>elderly</u> patients
Past history of claudications	Absent	Present
Past history of heart disease	Present	Usually absent
Source of an embolus	Present	Absent
Radial pulse (AF)	Usually <u>irregular</u> as AF is the commonest cause	Usually <u>regular</u>
Trophic changes	Absent	May be present
Appearance of collateral circulation on angiography	<u>Minimal</u> مش متواضع	<u>Extensive</u>

In addition to differentiation between embolism and thrombosis other conditions include:

① Phlegmasia cerulea dolens.

2. Aortic dissection.

③ Low flow states. → Shocked → Acute ischemia الحارة الحادة → ممكن تتلخبط فيه تفكره
Acute ischemia

4. Acute occlusion of popliteal and femoral aneurysm.

Treatment:

I) General measures of treatment:

1- Morphine for pain.

2- I.V. fluids to correct dehydration, if present.

3- I.V. heparin. Start with 5000 to 10000 IU followed by ~~3000~~ 5000 IU every 2 hours, the dose is controlled by checking activated partial thromboplastin time (APTT) every 12 hours, which should be maintained at 2 - 3 times the baseline level.

4- Care of cardiac condition:

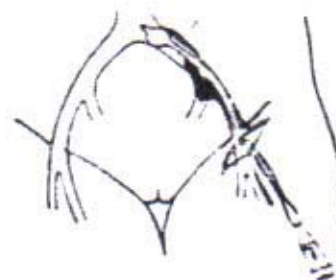
- Oxygen if needed.
- Lab tests, ECG and chest X-ray.
- Digoxin for rapid A.F.
- Lasix for heart failure.

الكلية التي عليها الحصان

II) Urgent embolectomy:

Under local spinal or general anesthesia, remove the embolus with the distal and proximal extension thrombus through a longitudinal or transverse arteriotomy using

Fogarty balloon catheter.



Embolectomy using Fogarty catheter.

- The Fogarty catheter is introduced until it passes the limit of the thrombus.
- The balloon is inflated and the catheter is withdrawn slowly, together with the clot.
- The procedure is repeated both proximal and distal until bleeding and back bleeding occurs with palpable distal pulses & operative arteriogram shows patent arteries.

من تحتها
due to
collaterals

- Irrigation of the distal arterial tree by heparinized saline.
- Finally arteriotomy is repaired.

قانون في الجراحة

أسبق المنطقة

Prognosis:

Embolectomy should be carried as soon as possible (within 6 hours) to avoid muscle necrosis and secondary thrombus formation.

- As long as these muscles are soft and the capillary circulation is preserved before the operation, the success rate is over 95% regardless the duration of ischemia.
- If calf muscles necrosis occurs the muscles are rigid, with loss of capillary circulation, the value of embolectomy (delayed embolectomy) is that when gangrene occurs, the level of amputation will be lower.

أخيراً Ambulation هتريسي على
below Knee ← below Knee أخيراً

N.B. كنت شغال عياني -- وعائز أبقي شفوي

- 1- A completion angiogram should ideally be done at the end of embolectomy to be sure that all emboli have been removed.
- 2- Heparin should be continued postoperatively until the cardiac condition is assessed and the need for further heparin therapy is determined.
- 3- The source of arterial emboli should be corrected if possible. (Rt Vent) ← يحول إلى قسم
- 4- For aortic bifurcation embolism embolectomy is done via a bilateral femoral arteriotomies.

Complications of embolectomy:

- 1- Sudden death may occur due to pulmonary embolism secondary to detachment of a large thrombus in the femoral vein. It is therefore advisable to do either:
 - a. Thrombectomy of common femoral vein if a thrombus is felt in the femoral vein at operation.
 - b. Ligation of the common femoral vein.
 - c. Putting a vena-caval filter.
- 2- Compartments compression Fasciotomy is done to relieve the tension.
- 3- Reperfusion injury of the kidney and heart may occur due to the passage of large amounts of myoglobin and potassium from the ischemic muscles.
- 4-

III) Fibrinolytic agents: (streptokinase, urokinase or tissue plasminogen activator) are tried to dissolve the embolus without surgery.

Technique of direct thrombolysis

- At the completion of arteriography the tip of the arterial catheter is embedded in the thrombus.
- The usual dose is 5000 unit/hour.
- Monitoring every 6 hours by APTT and fibrinogen titer.

Complications of direct thrombolysis

- Anaphylactic reaction with the use of streptokinase. • expensive
- Hemorrhage at the puncture site, GIT or cerebral.

IV) Amputation: ٣٣٣ complications

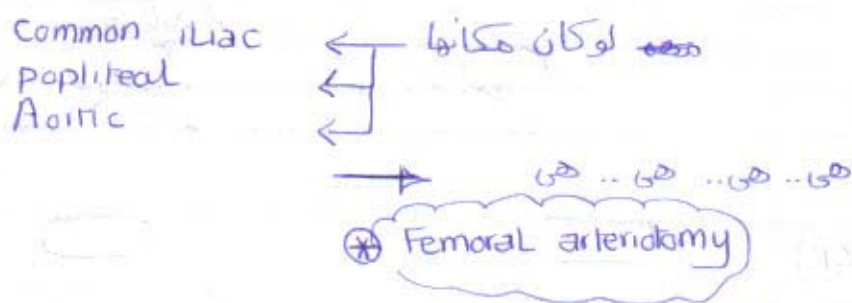
Indication: Established gangrene.

Acute arterial thrombosis

Arterial thrombosis can occur in the following conditions:

- 1- On top of chronic occlusive arterial disease, e.g. atherosclerosis (the commonest) or Burger's disease.
- 2- As a complication of arterial aneurysm.

- * Exact Localization of site of embolus is not needed
no investigations needed



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- 3- As a result of massive DVT.
- 4- As a result of traumatic contusion of vessels.
- 5- May complicate febrile illness or gastroenteritis especially in children. Dehydration leads to hemoconcentration with consequent thrombosis.

Treatment includes thrombectomy & reconstructive surgery to the arterial pathology.

Operative مهم جراحيا نظري و Arterial Injuries

Incidence:

Arterial injuries are increasingly common nowadays **due to:**

- 1- The increased **motor car accidents** and **war injuries**.
- 2- **Iatrogenic** injuries are now increasing with the introduction of invasive techniques, for the diagnosis and management of cardiovascular disorders.

Etiology:

- 1- **Penetrating injury** e.g. stabs, bullets passing through or near-by an artery **"near miss"**.
- 2- **Blunt injuries** as in road traffic accidents.
- 3- **Plaster or tourniquet compression.**
- 4- **Fracture or dislocation.**
- 5- **Iatrogenic: Following arterial cannulation.**

Pathological types:

A- Arterial injury with division:

- 1- **Complete division:**
 - Both ends bleed profusely but soon bleeding tends to stop spontaneously, and the divided stumps retract.
 - There is loss of distal pulse & manifestations of ischemia appear.
- 2- **Partial division:**
 - The contraction and retraction of the vessel wall cause the tear in the vessel wall to gap.
 - The artery will continue to bleed either externally or internally producing a pulsating hematoma.
 - Blood flow although diminished is not interrupted and keeps the viability of the part.
 - The distal pulse is palpable.

B- Arterial contusion with or without superadded thrombosis.

- The outer coats remain intact. If the trauma is not severe, damage occurs within the arterial wall with an intact intima.
- Unless contusion is associated with thrombosis, it cannot be diagnosed except during operation.

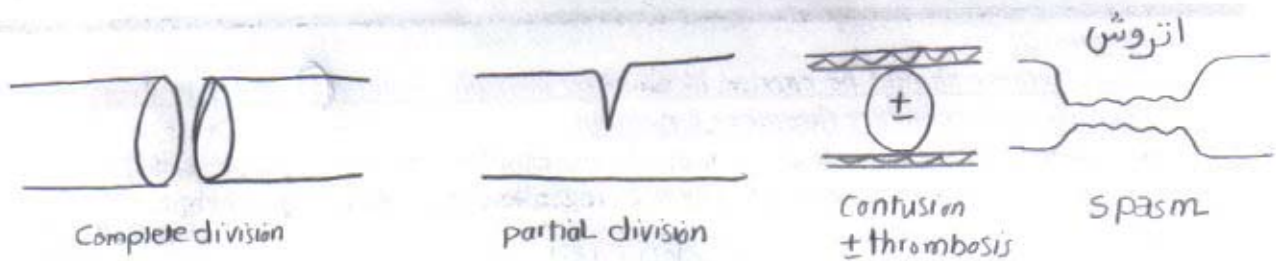
C- Arterial spasm:

- There is no much change in the vessel wall from outside.
- Intimal tear may be present. Spasm without any pathology is very rare and should not be diagnosed as a cause of loss of distal pulse and ischemia except after exploration.

D- Intra-arterial drug injection. (see later)

Clinical features and assessment of arterial injuries:

- ☐ **History of trauma**
- ☐ **General examination** to look for other injuries & vital signs to detect amount of blood loss.



سؤال شفوي Complete division أحسن ولا Partial ؟

partial طبعاً لأن Limb هيكلية

كل واحد فيه ميزة وعيب

	ميزة	عيب
Complete	retraction of ends → intima تكسح Bleeding أقل	distal ischemia
partial	distal flow مستمر	Bleeding أكثر

Acute ischemia ← thrombosis معاها Contusion * لو حصل

← thrombosis معاها Contusion مش شخصيه

→ شخصيه علشان معاها حاجة تاني
e.g. Fracture humerus

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□ **Local examination:** is the basis for diagnosing arterial injury.

1- **Hard signs:** These are **sure signs of arterial injury**.

افتحه فوراً

- External arterial bleeding.
- Loss of distal pulses,
- Any of the classic manifestations of acute ischemia.
- Pulsating or expanding hematoma.
- Palpable thrill or audible bruit heard with a stethoscope at or distal to the area of injury.

2- **Soft signs:** These are **less specific (equivocal) signs**.

مارو حوش .. اعلاه investigations

- Small or moderate sized hematoma that is not pulsating and not expanding.
- Proximity of penetrating wound to a major vascular structure.
- Adjacent nerve injury, producing neurological deficit.
- Presentation with shock that can't be explained by other injuries. In these cases the patient could have bled from an arterial injury & the bleeding could have stopped before hospital admission.

Investigations:

In patients with hard signs

Immediate surgical exploration is indicated without any diagnostic studies.

In patients with soft signs urgent investigations are needed.

1. Plain X-ray to detect foreign bodies or fractures.
2. Arteriography is the most accurate diagnostic study in these cases. ~~X-traumatic arterial aneurysms & pseudoaneurysms are detected by early venous filling.~~
3. Duplex ultrasonography can be a reliable substitute.
4. If the soft sign is "shock" no diagnostic studies should be done. Resuscitation is the first priority. Arteriography can be done in the operating room.

Treatment:

□ Immediate treatment for arterial injuries

1. Control of **external bleeding** (See shock).
2. **Resuscitation** by blood and IV fluids.
3. **Heparinization:** Systemic heparin is recommended only in patients with isolated vascular injury presenting with ischemia.
4. **Prophylactic antibiotics**

□ Definitive treatment:

مفاجأة

- Exploration is mandatory if the pulse is not felt after reduction of fractures.
- The chances of success of surgical treatment diminish after six hours of ischemia.
- After exposure of the artery, if it is divided or contused, proximal & distal control is applied.

1- In clean-cut arterial injuries:

- a. If there is a longitudinal incision or a transverse incision less than one half of the circumference, the injury is repaired.
- b. If more than half of the circumference is injured, complete division is performed & then direct anastomosis is done.

2- If the artery is contused or divided:

- Damaged edges or segments are excised.

- The proximal and distal segments are cleaned from clots by **Fogarty catheter**, flushed with heparinized saline ^{سائل بهافين}, and then clamped again.
- The injured area should be repaired by **patch angioplasty** (an autogenous vein graft or less often a synthetic graft).

3- If the artery is found spastic:

- Local application of papaverine and intra-arterial injection of heparin in saline.
- If not successful, forcible dilatation using Fogarty catheter is performed.
- If spasm still persists, excision of spastic segment with a saphenous vein graft is performed.

أغلب الحالات

- Damaged main **veins** should be repaired.
- Damaged **nerves** can be repaired or left for another setting.
- Distal **fasciotomy** is usually added.

عقل نظري

Intra-arterial drug injection

Due to wrongly injected drugs into arteries instead of veins. The most commonly punctured arteries are the brachial and the radial arteries. The block occurs in the small distal arteries of the digits.

Clinical features

- Burning discomfort extending from the point of injection to the tips of the fingers immediately after injection, rapidly followed by severe pain and blanching.
- Edema develops rapidly and may be severe.
- Coldness and cyanosis soon follow.
- The distal pulses are often normal.
- Digital gangrene and less commonly total extremity gangrene may then develop.
- Arteriography shouldn't be done as it won't add any more information to the clinical assessment.

Treatment

Treatment should start immediately:

- Heparin intravenously
- Dexamethazone 4mg IV every 6 hours.
- Low molecular weight dextran (dextran 40) minimizes platelet aggregation.
- Strong analgesics.
- Extremity elevation to reduce edema.
- Early passive and active exercises.

شفاوی ← intraarterial drug ^{inj.} ادو حاقه

نظا الایز وحقن Vasodilators , Heparin

* C/P

Acute Ischemia

Pulse may be felt as spasm affects small ~~vessels~~ ^{arteries}

tt/

heparin - Vasodilators

gangrene → Amputation

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nutrition

function

الدم قل لدرجة نأشعل

Chronic Ischemia

مهم جدا جدا شفو
محتمل نظري
مجايش نظري قبل كده

Definition:

Slowly progressive arterial obstruction.

Etiology:

- 1- Above the age of 45 years atherosclerosis is the commonest cause.
- 2- Below the age of 45 years:
 - a. In diabetics presenile atherosclerosis is the main cause.
 - b. In non diabetics:
 - In females Raynaud's disease in the upper limb & arteritis in both upper & lower limbs.
 - In males Burger's disease in the lower limbs and arteritis in both upper and lower limbs.
- 3- Other causes:
 - a. Vasospastic disorders: Ergotism, acrocyanosis, and erythrocyanosis frigida.
 - b. Aneurysm.
 - c. Incomplete recovery after treatment of acute ischemia
 - d. Vascular compression:
 - Thoracic outlet syndrome (in the U.L.). Compression of subclavian artery
 - Compression by tumor.

inlet نأسوما

قراءة Pathology of atherosclerosis:

- 1- The primary pathology of this disease is the atheroma, which starts as an elevated yellow plaque on the intimal surface of the arteries.
- 2- Accumulation of connective tissue matrix and lipids in the subintimal plane
- 3- The media shows fibrosis of the smooth muscles and degeneration of the elastic tissue
- 4- The adventitia shows fibrosis.

Site:

Trauma

trauma by blood flow

Atheromas most commonly occur adjacent to arterial bifurcations, at the origin of major arterial branches and at sites where an artery passes beneath or through a fascial sling (superficial femoral through adductor hiatus)

Risk factors: (Type of the patient)

Ischemic heart disease,

- Hypertension, hypercholesterolemia, cigarette smoking.
- Diabetes mellitus, hypertriglyceridemia, obesity.
- Sedentary or stressful lifestyle and a positive family history.

Distribution:

In descending order of frequency they affect the coronaries, cerebrals, arteries of the lower limbs, the renals, superior mesenteric, celiac and arteries of the upper limbs. the least

* Profunda femoris not affected [always patent through anastomosis]

Clinical picture:

1- Pain:

The main presentation:

a- Intermittent claudication:

- The earliest symptom: Cramping pain, this occurs on walking & relieved by rest.
- The distance which the patient can walk until pain occur is called claudication distance and the time which the patient can walk until pain occur is called the claudication time.

as it is protected from trauma by muscles (Sling الشنج مش)
→ Thigh doesn't die الشان لا يموت
Above knee amputation

* Causes of Ischemia in U.L.

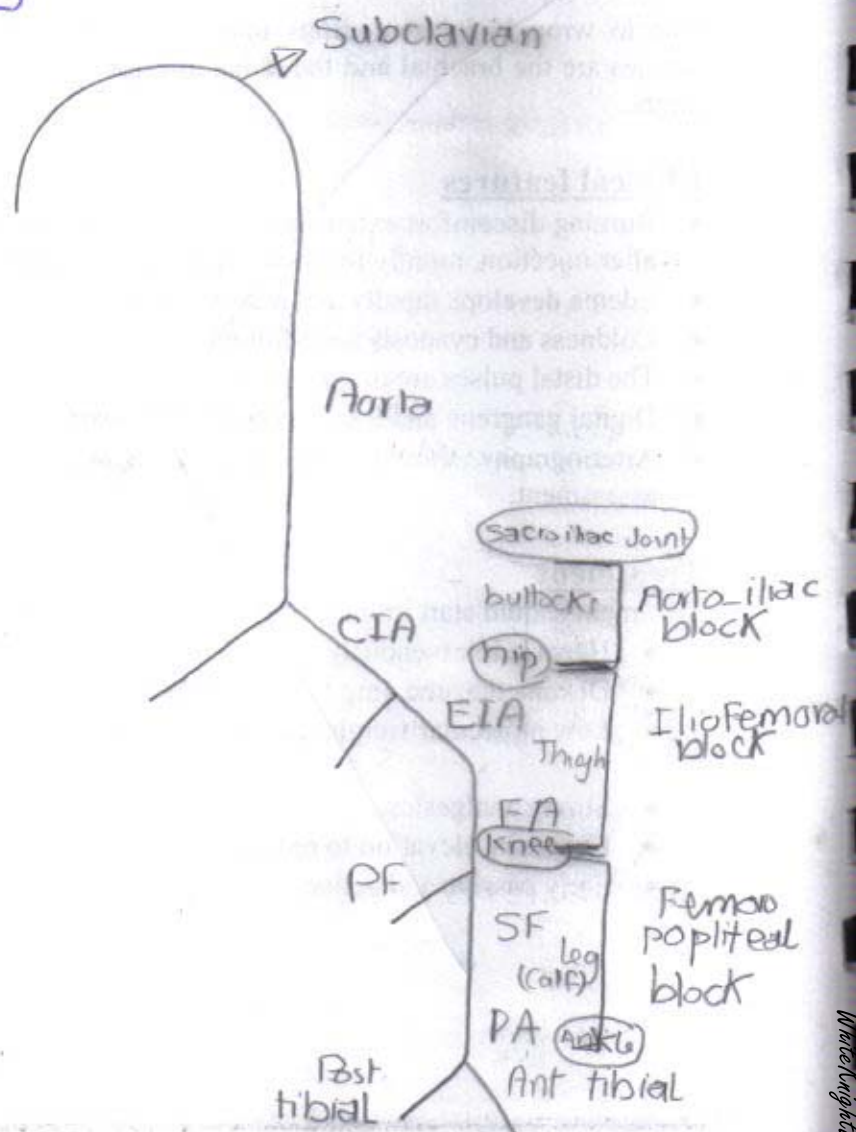
- 1- Renauld's disease
- 2- Thoracic outlet Syndrome
- 3- Arterial injury
- 4- Embolism
- 5- Intraarterial injection of irritant drugs [Heroin]

Upper Limb arteries are less affected by Chronic ischemia as subclavian artery is side branch of Aorta not subjected to trauma as bifurcations in Lower Limb arteries

✂ Trauma → ✂ deposition of fat in intima & subintimal area → ✂ atherosclerosis in U.L.
Atherosclerosis in U.L. may be present but not occluding the artery

W
W
W
.
d
r

b
a
c
a
r
.
c
o
m



- As the disease progress, the claudication distance gradually shortens and the period of rest increases in length
- Site of pain depends on site of obstruction (one joint distal to the site of obstruction)
- **Mechanism:** Accumulation of metabolites due to muscle ischemia during walking. These metabolites are gradually washed away during rest.

b- **Rest pain:**

- A continuous burning pain occurs during rest, which is maximum at night in the forefoot and toes. It is worsened by elevation of the limb.
- At first relieved by hanging the limb by the side of the bed and exposing it but in severe cases analgesics cannot relieve it completely.
- It occurs in advanced cases due to ischemic neuritis (nerve ischemia).

Coldness → PP pain: VC

Hotness → PP pain: PP metabolic rate... but blood supply is low

- **Claudication:** From the word: **Claudications = to limp.** يخرج
(The Roman emperor Claudis, Walked with a limp due to polio).
- **Pseudo claudication:** It is due to **neurospinal compression** or **Sciatica**
Symptoms increases by **lumbar lordosis**, so standing or walking causes symptoms which are not relieved till the patient sits and straightens his Lumbar spine.
- **Rest pain:**
 - Relieved by **standing erect** as gravity aids the delivery of arterial blood to L.L.
 - Classically, it is preceded with claudications but may occur de-novo in patients whose walking is limited by other diseases (e.g. **Angina pt**)
- Although ischemia affects both L.L., the **patient feels pain in one limb only** (the more affected) as he stops walking before developing pain in the less affected limb. Similarly a patient with **generalized atherosclerosis** may present only by **angina pain**, which forces him to stop walking before developing claudication in his limbs.

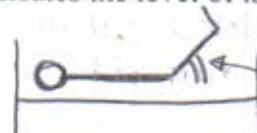
2- **Trophic changes:**

- a- **Skin:** Atrophic, thin, dry, scaly, inelastic skin with loss of hair. **Ischemic ulcers** begin over the toes or foot.
- b- **Loss of subcutaneous fat, thin tapering toes.** أوله واحدة تحصل
- c- **Nails:** Loss of luster, fissured, brittle, deformed.

3- **Skin temperature:** The level of coldness indicates the level of ischemia.

4- **Color changes:**

- **Mild ischemia:** color may be normal.
- **Moderate ischemia:** postural color changes, pallor on elevation (**Buerger's angle**) and **Rubor** on dependency.
- **Severe ischemia:** fixed color changes: Pallor, cyanosis & redness (**Rubor**)
- The cyanosis & rubor are due to stagnation of blood in the markedly dilated capillaries under the effect of accumulated vasodilator metabolites. The color of blood is at first red (**Rubor**) later on it becomes blue due to extraction of oxygen by tissues.



حتى لو رفعناها 90° Normally not present

Vertebral man

شفوي: يهودي

زرقه وهى على السبر

5- **Arterial pulsations:**

Weak pulsation (partial obstruction or in presence of good collaterals) or absent pulsation (complete obstruction).

Disappearing pulse: disappear during exercise as collaterals running through

- 6- **Motor and sensory changes:** Muscle weakness, hyperesthesia or sensory loss.
wasting hyposthesia the muscle provide blood supply to working muscles → no pulse

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* Criteria of severe ischemia

- 1- Claudication distance < 50 m
- 2- Rest pain
- 3- Buerger's angle $< 20^\circ$
 (or) Fixed colour changes
- 4- Venous filling time > 2 min.
- 5- Ankle brachial index < 0.7 .

7- Gangrene in severe ischemia. (Dry)

8- **Impotence** may occur in aortic bifurcation block (*Le Riche Syndrome*) due to diminished blood flow in the internal iliac arteries.

9- **Superficial thrombophlebitis**: in Buerger's disease (migrating)

Special tests:

1- Capillary circulation test:

Note the effect of pressure on the nail bed or skin.

- **Normally** pressure causes blanching & release of pressure is followed by immediate return of normal color.
- In **ischemia**, slow return of normal color indicates sluggish capillary circulation and failure of blanching indicates that the part is gangrenous.

2- Harvey's venous refilling test:

- **Normal**: venous filling occurs in 10-15 seconds.
- In **mild ischemia**: delayed up to 30 seconds.
- In **severe ischemia**: delayed more than 2 minutes.

In moderate ischemia delayed up to 30 sec. - 2 min.

Staging of chronic limb ischemia:

1. **Functional Ischemia**: presents with claudication, ischemic ulcer or gangrene.
2. **Critical ischemia**: the stage of impending limb loss or the pre-gangrenous stage & denotes severe ischemia with persistent rest pain for more than 2 weeks.

Differential diagnosis:

I-

	<i>Atherosclerosis</i>	<i>Buerger's disease</i>
Age of start	Elderly	20 - 40 years
Sex	Usually in males, possibly females	Only males, never females
Etiology	Main risk factors are hypertension, high cholesterol & DM	Excessive smoking
Level of lesion	Aorto-iliac, femoro-popliteal or distal	Distal vessels with patchy distribution
Pathology	Mainly intimal (atheroma)	Inflamed neurovascular bundle & thrombi that block lumen
Migrating thrombophlebitis	Absent	Usually present
Rest pain	Rest pain is late	Rest pain is early

II- Other causes of chronic pain in lower limb

Investigations:

I- Laboratory investigations:

a- **Urine**: For sugar.

b- **Blood**:

- Full blood picture for anemia polycythemia (increased blood viscosity).
- Blood sugar curve for D.M.
- Blood urea and renal function tests. commonly renal arteries are affected
- Serum cholesterol and lipid (high in atherosclerosis).

• **ECG** and **fundus examination**: Atherosclerotic changes in Retina

Systemic disease

V.V.
- Osteoarthritis
- Peripheral neuritis
- Flat foot
- Sciatica

	Atherosclerosis	Buerger's disease
Age of onset	elderly > 45y	20 - 40 years
Sex	usually in males possible in females	only males never females
Etiology	main risk factors are: HTN - high Cholesterol - DM	excessive smoking
Level of Lesion	Aortoiliac - Femoropopliteal - distal	Distal vessels
Pathology	mainly intimal (Atheroma)	inflamed neurovascular bundle
Migrating thrombo-phlebitis	Absent	usually present
Rest pain	Late	early
Gangrene	Late - extensive	early - limited
Popliteal pulse	Absent	Present
Claudication	Calf	Shin
Amputation needed	Above knee	below knee
Angiography	may detect patent distal run off	not indicated "no chance for distal run off"
Direct arterial surgery	may be feasible بئف	not feasible مفئش
Sympathectomy	of limited value	beneficial

II- Radiological investigations:

A- Doppler Ultrasound:

Values: **not invasive**

- 1- It is possible to **map out** obstructions or stenosis over arteries.
- 2- The **systolic pressure** can be measured even where the arterial pulse is not palpable.
- 3- Helpful in observing the **success of arterial reconstruction**.

B- Measurement of Ankle-brachial pressure index (PI): (by using the doppler)

The ratio of pressure measured in the posterior tibial artery at the ankle, to the pressure in brachial artery. The resting PI is greater than 1.

- If the ratio is < 0.9 it denotes ischemia.
- If < 0.7 = severe ischemia
- If < 0.3 = impending gangrene.

C- Duplex scan: it visualizes the arteries & it can detect stenosis.

D- Arteriography: (main method in diagnosis).

1- Indication:

It is done only after the decision of surgery has been under taken.

2- Values:

Shows:

- a- The condition of the arteries.
- b- Site and extent of any obstruction.
- c- Efficiency of collateral circulation. (condition of collaterals)
- d- Peripheral run off (distal blood flow beyond the occlusion). This is the most important as it determines the possibility of **direct arterial surgery**.

3- Methods:

a- **Direct percutaneous femoral arteriography**

b- **Aortography**

- i. Retrograde transfemoral aortography

using **Seldinger's needle**.

- ii. Direct translumbar aortography.

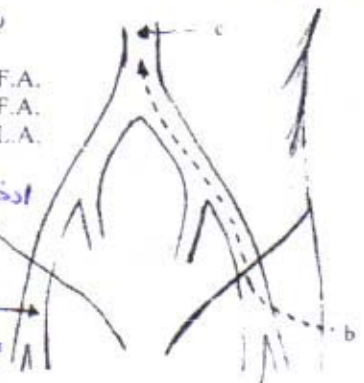
- iii. Transbrachial aortography: If the whole distal aorta is occluded.

4- Hazards:

- a- Anaphylaxis. (dye)
- b- Hemorrhage. (diseased artery)
- c- Spasm.
- d- Thrombosis.
- e- Dislodgement of **atheromatous plaque** + embolization.
- f- Dissecting aneurysm.

Fig. (2)

a- D.TF.A.
b- R.TF.A.
c- D.TL.A.



Aortography

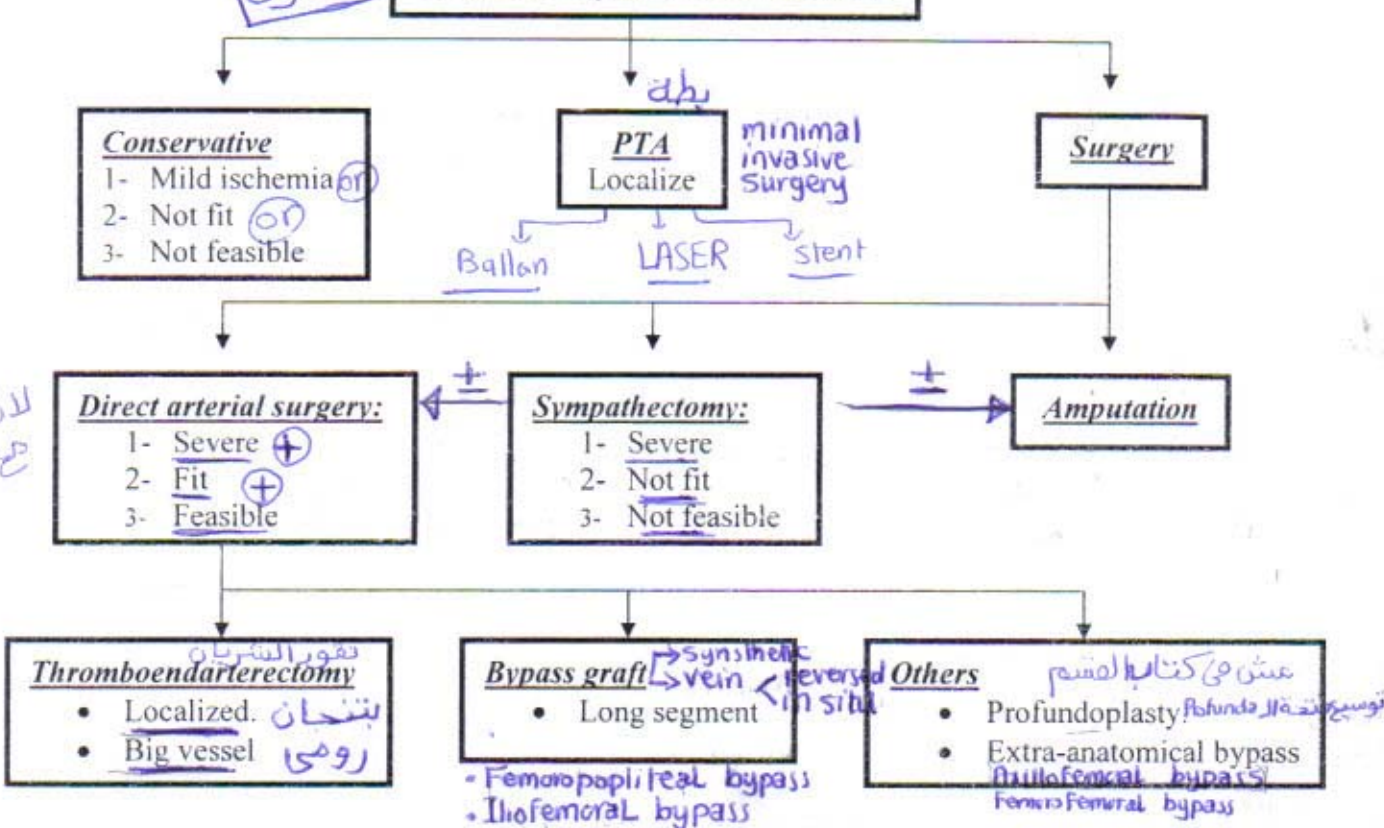
E- **Digital subtraction angiography (DSA): Less invasive than the conventional arteriography.**

Treatment:

تعمل يا به للبيان ده؟؟

تنفوي

Treatment of chronic ischemia



In Buerger's disease it is common to find
Tinea Interdigitalis

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Replaced by the
horizontal pages

14'

14''

* General trend in all surgery nowadays is toward minimal invasive surgery.

* minor trauma or minor infection may precipitate gangrene in patient of chronic ischemia

* Feasible for surgery رجليك جوهرة

Proximal obstruction with patent distal run off

* Not feasible for surgery

1- Distal obstruction

2 Proximal obstruction with no patent distal run off.

*

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the horizontal pages

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14''

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TREATMENT OF CHRONIC ISCHEMIA

	CONSERVATIVE METHODS	INTERVENTIONAL RADIOLOGICAL PROCEDURES	SURGICAL TREATMENT	
			Direct arterial surgery (Arterial reconstruction) ①★	Indirect arterial surgery (Lumbar sympathectomy) ④★
Indications	1- Mild ischemia. 2- Poor general condition of the patient. <i>not fit</i> 3- When an operation is not technically feasible <i>not feasible</i>	Localized obstruction in large and medium sized arteries.	a- Severe ischemia (rest pain or pre-gangrene). ②★ b- Adequate run off. <i>feasible</i> c- Proximal arterial occlusion (anywhere from abdominal aorta to the terminal part of popliteal artery). d- Good general condition <i>fit</i>	Indications: ④★ ① Cases of ischemia when direct arterial surgery is NOT feasible i.e. with distal occlusion (Bad distal run-off). It is of value in cases: a- With ischemic ulcers b- With rest pain. <i>VD (especially cutaneous) not muscular</i> Contraindications: 1- Intermittent claudication (worsen the muscle ischemia). 2- Gangrene (ineffective). 3- DM: peripheral neuropathy → autsympathetomy
Methods	1- Mild exercise short of causing pain (help the collateral circulation). 2- Stop Smoking 3- Correction of anemia. 4- Control of DM, hypertension and hyperlipidemia. 5- Drugs: ↓↓ platelet aggregation as dipyridamole, small dose of aspirin, pentoxifylline or PGE. 6- Protection of ischemic parts: a) Carefully washed, dried, and powdered. b) Protected by woolen socks (in winter) and suitable shoes. c) Nails and corns are cut cautiously. <i>to prevent minor trauma</i> d) Infections are treated properly.	1- Percutaneous transluminal angioplasty (PTA): a special balloon catheter is introduced percutaneously until it reaches the stenosed or occluded segment then inflated to dilate the stenosed segment. 2- Application of stent: After balloon angioplasty 3- Destruction of the atheroma by laser can be performed before angioplasty.	A) Thromboendarterectomy: • Indication: Large artery (e.g. aorta and common iliac) and localized lesions. • Removal of the thickened atherosclerotic intima with the overlying thrombus using endarterectomy loop. ③★ B) Bypass grafting: • Indication: Big and medium sized artery with extensive or multiple lesions involving a long segment. • Types of arterial grafts: 1- Synthetic grafts: Teflon, Dacron or PTFE. [<i>Poly Tetra Fluoro Ethylene</i>] Indication: Large arteries e.g. Aorto-iliac segment. 2- Autogenous grafts: Using long Saphenous either: a. Reversed long Saphenous vein graft: to prevent obstruction by its valves. It is the graft of choice for femoro-popliteal segment. b. In situ long Saphenous vein graft: valves are destroyed using special valve stripper. All tributaries are ligated to prevent A.V. fistula.	Amputation There are 2 possibilities: 1- Conservative Amputation: If blood supply of adjacent tissues is good or can be improved, line of demarcation appears and separation proceeds by aseptic ulceration. In such cases do either: a- Excision of toes at line of demarcation leaving raw surface to heal by granulation. b- Transmetatarsal or midtarsal amputation in forefoot gangrene provided there is viable long plantar flap reaching base of toes, to cover the stump (dorsal skin cannot withstand trauma). 2- Urgent high amputation: Indications: 1) Spreading gangrene endangering the patient's life. 2) Uncontrollable infection and toxemia. 3) Severe pain deteriorating the general condition of the patient. Level of amputation: Depends on the blood supply sufficient for wound healing: a- In atherosclerosis (involve femoral art.) above knee amputation (the stump will be supplied by the profunda femoris). b- If popliteal pulse is felt below knee amputation

Thromboendarterectomy



Bypass grafting



A.H.

RAMY ALKONAIESY

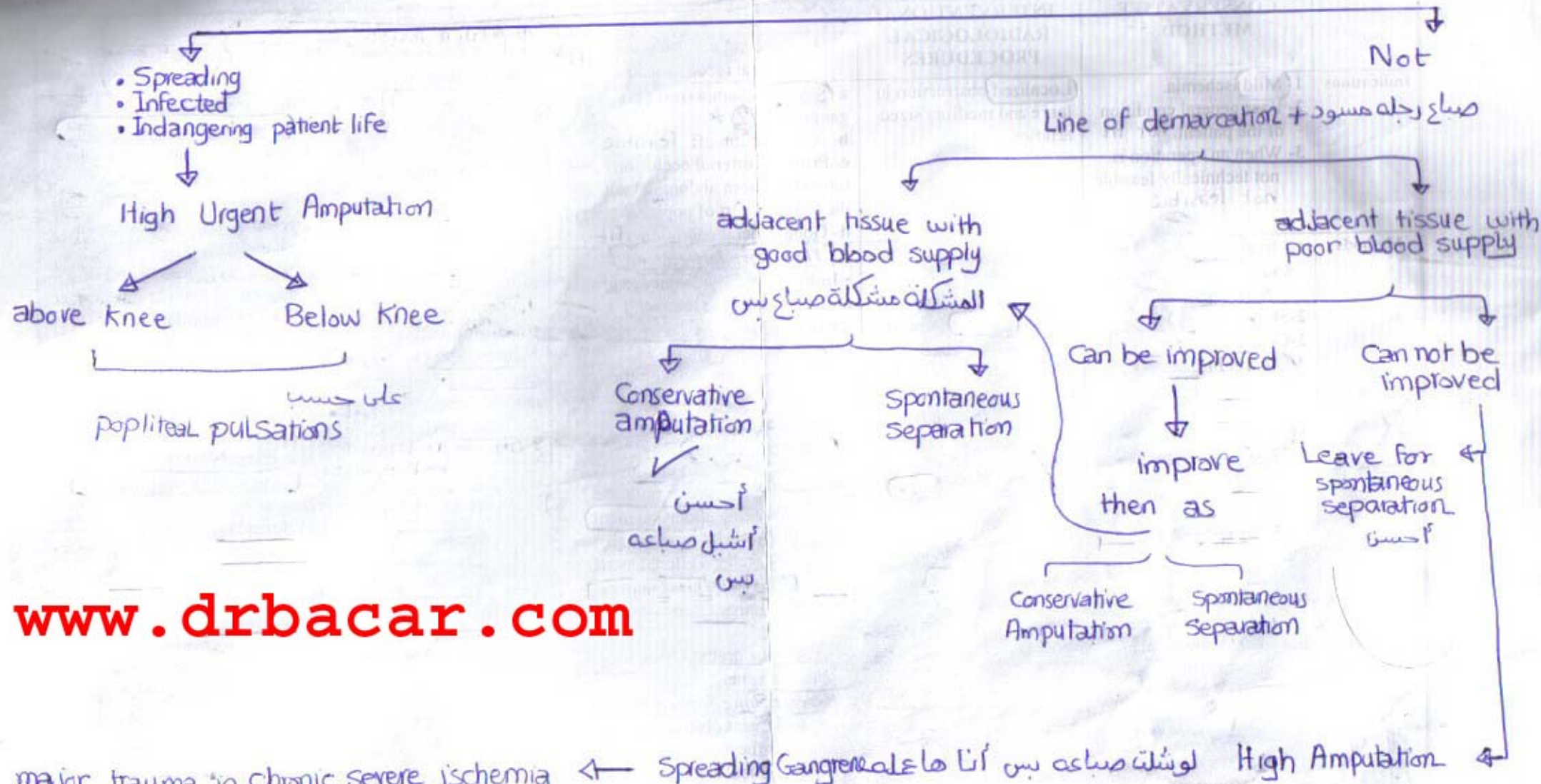
Bacterial

Fungal

Interdigital
in Burge's disease

- ★ ① Direct arterial operations are salvage procedures & should not be performed for early mild cases (e.g. intermittent claudication) as if the operation fails loss of the limb may occur.
- ★ ② Claudication is a relative indication for surgery e.g. if the patient may lose his job. *moderate ischemia* - can not walk for a long distance
- ★ ③ In Thromboendarterectomy before closing the arteriotomy incision, the distal intima should be attached to arterial wall by interrupted sutures to prevent its dissection later on.
• If amputation is to be done bilateral, do your best to do below knee on one side.
- ★ ④ 2 many surgeons combine lumbar sympathectomy with direct arterial surgery
- 3- After Amputation to help wound healing.

Gangrene



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major trauma in chronic severe ischemia ← Spreading Gangrene لو شلت صباعه بين أنا هاعلمه High Amputation
 Severe Gangrene في عيان minor Amputation أخطر حاجة

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Arterial Aneurysm

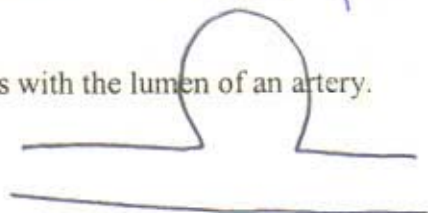
Arterial Aneurysm

Jar Aneurism
Clinical

Definition:

A sac that contains blood or blood clot and communicates with the lumen of an artery.

They can be classified according to A, B and C.



1. Etiology:

1- Pathological: The commonest causes:

- Atherosclerosis: (the commonest cause nowadays).
- Syphilis affecting aortic arch.
- Subacute bacterial endocarditis → infected emboli → mycotic aneurysms.
- Collagen diseases e.g. Behcet disease, Marfan's syndrome.

Oral ulcers

Arterial Disorders**2- Traumatic:**

- Weakening of the wall of the artery and dilatation later (*true aneurysm*)
- Interruption of the wall leading to pulsating hematoma which when organized forms an aneurysm (*false aneurysm*).

3- Congenital:

Commonest in circle of Willis → subarachnoid hemorrhage.

2. Structure of the aneurysm:

- True aneurysm:** The wall of the aneurysm is formed by the stretched wall of the artery (3 layers).
- False aneurysm:** The wall is formed of fibrous tissue due to organization of pulsating hematoma.

3. Shape:

- Fusiform.
- Saccular.
- Dissecting aneurysm.

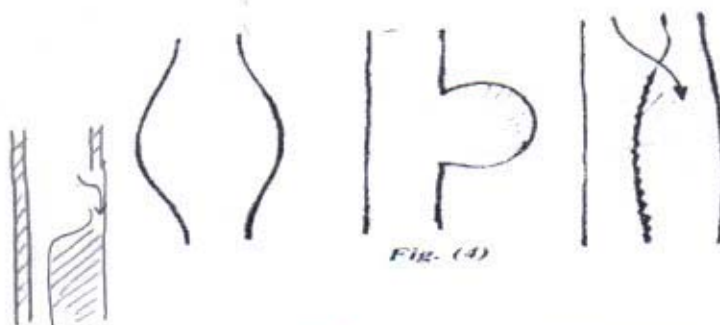


Fig. (4)

Clinical picture:**A- May be silent.**

B- General examination: Manifestations of the cause e.g. syphilis, atherosclerosis...etc.

C- Swelling which is:

- Along the course of an artery.
- Expansile pulsations synchronous with the heart beats.
- Moves side to side across but not along the course of the artery.
- Compressible (not compressible if filled with a thrombus), smooth, rounded.
- Proximal pressure reduces the size and pulsations.
- Distal pressure increases the size of the aneurysm.
- There is a systolic thrill on palpation, which propagates distally.
- Auscultation: Systolic murmur.

D- Compression on adjacent structures:

- Edema due to compression of main veins.
- Compression of a nerve leads to pain, sensory loss and paralysis.
- Adjacent bone may be eroded.

E- Picture of complications:

- Rupture:** The most serious.
- Thrombosis.**
- Embolization** due to detached thrombi from the aneurysm leading to distal ischemia.
- Pressure on the surrounding structures** (artery, veins, bones, nerves...etc).
Pressure on lumbar vertebrae → backache mistaken for Sciatica
- Infection:** May lead to secondary hemorrhage. thrombus JI
- Distal ischemia due to:**
 - Thrombosis of the aneurysm.
 - Compression of the main artery.
 - Embolization.
 - Associated atherosclerosis.



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Differential diagnosis:

characters of aneurism اعراض

1- Transmitted pulsation:

- Not expansile & pulsation disappear if you push the mass away from the course of the artery.
- No decrease in size of the swelling with proximal compression.

2- Pulsating tumors e.g. vascular sarcoma:

- Irregular in shape and consistency, not compressible, ill defined.
- Do not overlies the line of a main artery.

3- Arteriovenous fistula:

- Pulsating V.V.
- Machinery murmur and thrill, which propagates distally and proximally.
- Tachycardia and Brannan's sign.

4- Acute abscess.

any abscess along the course of an artery → infected aneurism

5- A serpentine artery

is sometimes the case as with the common carotid.

Investigations:

1- Plain X-ray:

- Eating up of nearby bone. endoscopy
- Calcification in cases of atherosclerosis.

2- Duplex scanning.

3- Abdominal ultrasound:

☆☆☆

the most important

- It is the investigation of choice in aortic aneurysm.
- It gives an accurate idea about its size.

4- CT scan

can demonstrate the relation of the aneurysm to the renal vessels. It can visualize leaking aneurysms.

5- Magnetic resonance arteriography

is a good alternative to CT-scan but is more costly in diagnosis of abdominal aortic aneurysm.

6- Conventional angiography and digital subtraction angiography (DSA):

Not routinely needed. visualiser arterial tree

Value:

- Visualize the relation of the aneurysm to the renal or mesenteric vessels.
- Visualize the distal arteries.

It should be noted that an angiogram might appear normal if the aneurysm is occupied by a thrombus.

Treatment:

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Aneurysms are very liable to rupture. So, any aneurysm larger than 4 cm (5 cm in case of aortic aneurysm) should be treated surgically.

1- The standard line of treatment is excision and graft:

The aneurysmal sac is excised. The continuity of artery is restored by arterial grafting either by autogenous vein graft or synthetic graft made of Dacron.

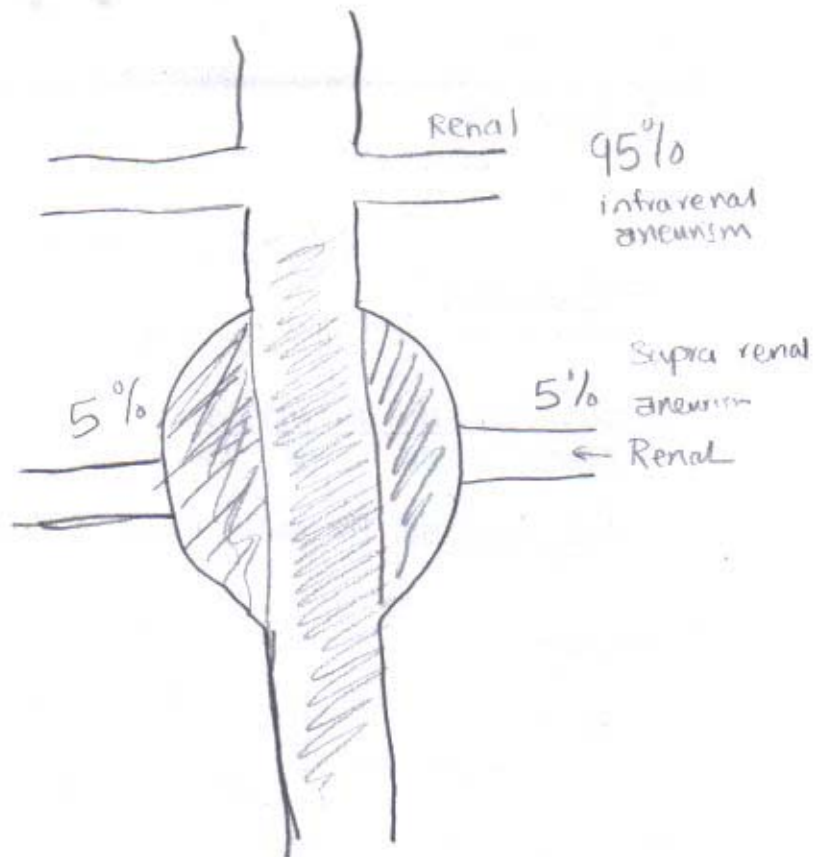
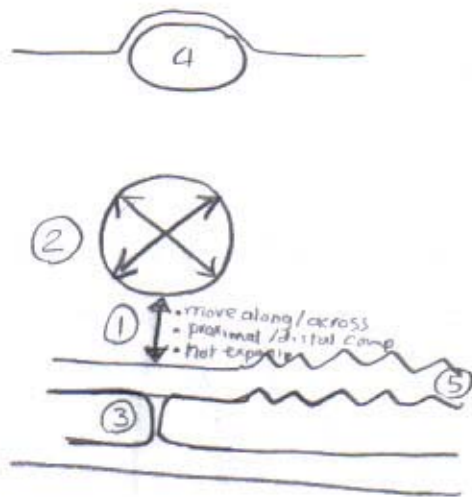
However, other surgical techniques may be performed:

2- Insertion of a graft inside the sac of the aneurysm without removal of the sac.

This is commonly done in aortic aneurysm (the graft is anastomosed to the aorta above and below the sac).



Fig. (5)



treatment

إحالة ال

- * excision  graft → standard
- * graft without excision → Aorta
- * excision without graft → small branches

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- 3- Excision and ligation of proximal and distal arteries can be performed in aneurysms of radial or ulnar arteries and other small arteries.

Abdominal Aortic Aneurysm

Incidence: This is the commonest type of arterial aneurysms.

Site: Below the origin of the renal arteries in 95 % of cases. It may extend to affect the iliacs.

Etiology: Atherosclerosis is the cause in 95 % of cases.

Clinical picture: as general.

Complications:

As usual + Rupture or leakage.

- Intraperitoneal rupture (20 %) is rapidly fatal, but fortunately most ruptures (80 %) occur retroperitoneally and the patient can be saved.
- The patient presents by hypovolemic shock, severe abdominal pain and backache and rapidly enlarging, pulsating mass in the lumbar region.

Investigations: As general.

Treatment: As general.

Plan of management

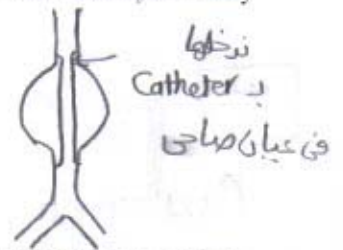
- **Immediate surgery** for patients with the diagnosis of rupture.
- **Urgent surgery** for patients with symptoms of acute expansion
- **Elective surgery** for:
 - Symptomatic aneurysms regardless of the size.
 - Asymptomatic aneurysms 5cm or more in diameter.

Sonar

كان املاح 3 سم الباردة 5 سم

Type of surgery

- The standard is **conventional open surgery** by opening the aneurysm and excluding it by implanting a synthetic graft.
- **Endovascular repair:** this technique is expensive and recurrence of the aneurysm may occur and indicated for:
 - High risk patients *Atherosclerotic - old age*
 - High-risk local abdominal factors *peritonitis*



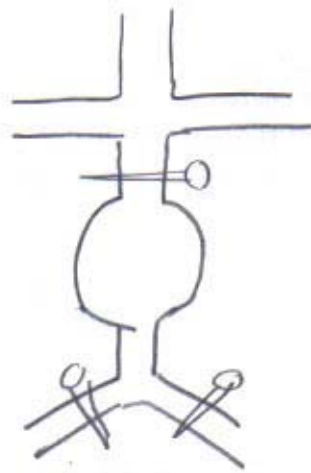
Thoracic aortic aneurysms

- Aneurysmal dilatation may affect the aortic arch, the descending aorta or may extend into the abdomen forming a thoraco-abdominal aortic aneurysm.
- The usual cause is atherosclerosis. Other causes include trauma, Marfan's syndrome. Syphilitic aneurysms are rarely seen.
- Presents with space-occupying manifestations e.g., mediastinal syndrome.
- CT scan or MR! is the investigation of choice.
- Surgery entails excision of the diseased segment and interposing a synthetic graft. The three branches of the arch are implanted in the graft.
- One possible complication of thoracic aortic injury is paraplegia as a result of interrupting the blood supply of the spinal cord.

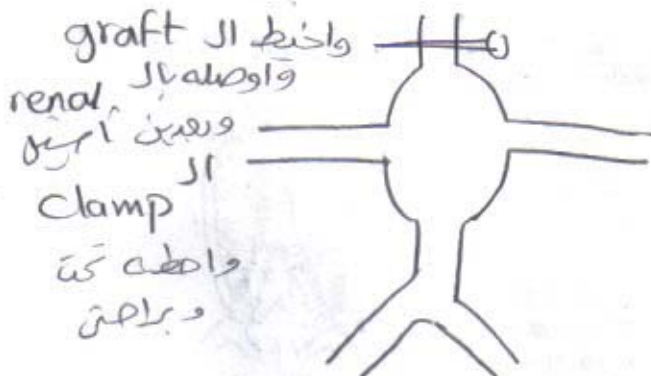
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Blop sign by A.H-



infrarenal



Suprarenal

Aortic dissection

Predisposing factors Atherosclerosis and hypertension.

Pathology:

- An intimal tear allows blood to dissect its way in the media in a caudal direction.
- Blood in the false lumen may rupture inside the true lumen or may rupture to the outside causing fatal hemorrhage. As blood dissects its way distally it occludes the ostia of aortic branches causing ischemia.

There are two main types.

Type A: more serious type. Dissection starts in the ascending aorta. It is likely to produce aortic incompetence, coronary artery occlusion and fatal cardiac tamponade.

Type B: Dissection starts distal to the arch.

Clinical features

Severe chest pain radiating to interscapular region similar to that of myocardial infarction.

Investigations: ECG, CT chest, aortography & Echocardiography.

Treatment

- Type A requires urgent surgery by a synthetic graft at the aortic root.
- Type B is treated by antihypertensives. Elective surgery may be needed in cases of chronic extension of dissection.

A-V Fistula

Definition: Abnormal connection between an artery and a vein.

Pathological types:

- 1- **Aneurysmal varix:** Direct communication between an artery and a vein.
- 2- **Varicose aneurysm:** The artery and vein communicate through a false sac.

Types:

A- Congenital:

Usually small, multiple, deep in the limbs leading to local gigantism, edema, congestion, pulsating V.V and venous ulceration. Multiple haemoangiomas are common.

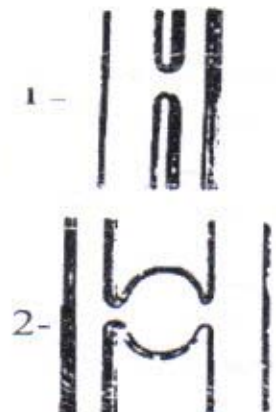
↳ glomus

B- Acquired: Due to penetrating trauma.

1- Local signs:

- Cystic, smooth, rounded, compressible swelling.
- Along the course of an artery.
- Compressing proximal reduce its size and pulsation.
- Continuous thrill, machinery murmur, which propagates both distal and proximal.
- **No local gigantism.**

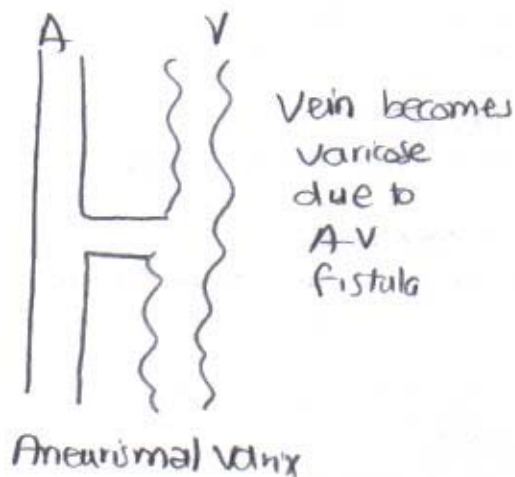
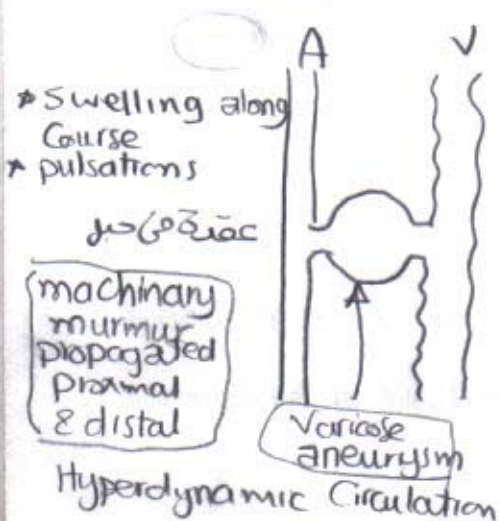
Fig. (6)



A-V fistula

abnormal communication between A & V

normal Communication is present in



Congenital: multiple - small - deep - local - gigantism
usually associated with 2ry V.V

traumatic

induced: in case of renal Failure



Acquired: Repair Fistula A & V

Sometimes difficult due to fear of nerve injury

- * Close proximal & distal to A-V fistula
- * bypass



2- Distal signs:

- Congestion, edema, pulsating V.V.

رودة دم

3- Systemic signs:

علامات

Tachycardia, water hammer pulse, Branham's sign (slowing of heart rate as soon as the fistula is compressed).

C- Induced: In R.F. for hemodialysis.

Investigations:

- 1- Doppler.
- 2- Arteriography.

Treatment:

1- Congenital:

multiple < small deep

Usually no surgical treatment. If single and accessible, excision and vascular repair is done.

2- Acquired:

- Operative interference is delayed for 3 months (to give chance for the collaterals to open)
- Excision and vascular repair, if this fails the artery is ligated above and below the fistula and its continuity is restored by graft.

Gangrene

موت نكري وشقي

Definition: Death (usually with putrefaction) of a macroscopic part of the body.

Etiology:

VAN TIP

if microscopic → necrosis

- 1- Diabetic infective gangrene.
- 2- Ischemic or vascular gangrene: (secondary to arterial obstruction).
- 3- Neuropathic: as in syringomyelia & leprosy.
- 4- Traumatic: may be direct due to crushing or pressure (bed sores), or indirect (arterial injuries).
- 5- Physiochemical: as in burns, corrosion or frost bite.
- 6- Infective:
 - a. Specific infections: Clostridial gas gangrene.
 - b. Non-specific infections as carbuncle, ~~gangrenous~~.
- 7- Venous gangrene: due to massive thrombosis of iliofemoral vein (Phlegmasia cerulea dolens).

Clinical types:

	1- Dry gangrene	2- Aseptic moist gangrene
Tissues	Hard, dry, wrinkled and shrunken.	The part remains of the same size and consistency but discolored.
Etiology	Gradual ischemia giving time for surface evaporation & for venous & lymphatic return.	1- Acute ischemia. 2- Artery is blocked with impairment of venous and lymphatic drainage. 3- Coincident venous occlusion.
Color	Dark brown or black.	At first dead white, later purple or greenish black.

3- Septic moist gangrene:

أكبر من الحجم

The tissues are swollen and edematous, markedly inflamed and of offensive odor. There is severe inflammatory reaction in the living tissues above it. Toxemia is severe.

It may be:

- a- **Primary septic gangrene:** Sepsis is the cause.
- b- **Secondary septic gangrene:** Infection of a sterile gangrene.

Clinical picture:

- 1- **History of the cause.** *التاريخ المرضي*
- 2- **Stage of threatened gangrene:** (Press and see how color fades)
 - a. Loss of pulsations
 - b. Loss of Sensation
 - c. Loss of heat *خلة طوب* *حرارة الأوعية*
 - d. Fixed Color changes
 - e. Loss of function
 - f. Capillary circulation stilt present. *stage of gangrene* *لونها باقية*
- 3- **Stage of gangrene:**
 - a. **General manifestations:** Marked in septic gangrene & mild in dry gangrene in the form of toxemia; fever, headache.
 - b. **Local manifestations:** As stage of threatened gangrene. **No capillary circulation**, the affected part is green, brown or black due to disintegration of Hb with formation of iron sulphide.

Investigations: it differs according to the type of gangrene.

Special Varieties of Gangrene Diabetic foot infection & gangrene

Predisposing factors:

Diabetic patients are susceptible to serious foot infections due to:

- 1- **Peripheral neuropathy:** This makes the patient unaware of injuries insults.
- 2- **Vascular affection:** Either the major vessels are affected by atherosclerosis, which usually occurs at a young age group, or the terminal arterioles are affected by micro angiopathy.
- 3- **Compromise of the immune system:** Both humoral and cellular immunity are disturbed.

Etiology:

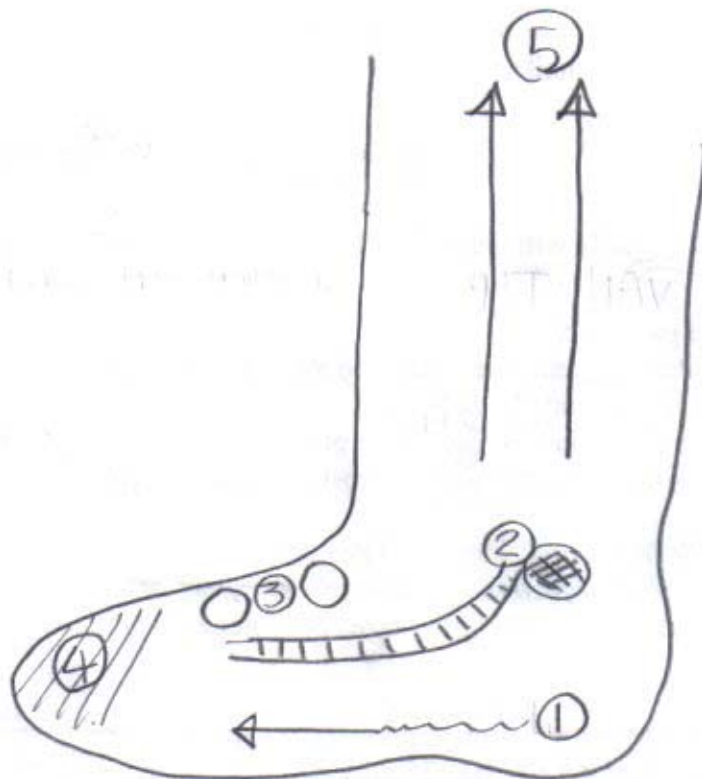
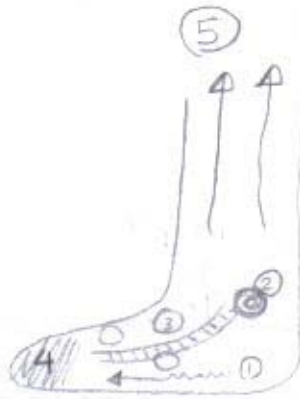
May be due to one of the following:

- 1- **Pure infection.**
- 2- **Pure ischemia:** This is a dry ischemic gangrene occurring in a diabetic patient with major vascular obstruction. *(Atherosclerosis → Chronic ischemia → dry gangrene)*
- 3- **Neuropathy.**
- 4- **The mixed type:** There is severe infection in addition to major vascular & neuropathic affection.

Clinical picture:

- 1- **Infective type:** Usually there is history of a trivial trauma or infection. *الرسمه*
 1. Virulent spreading infection involves the foot with severe edema.
 2. Fascial spaces, tendon sheaths and the bones are rapidly involved.
 3. Multiple pockets of pus develop.
 4. Local: Tissues become necrotic.
 5. General: patient looks very toxic with high pyrexia & may develop septicemic shock.

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infective type

- 2- **Ischemic type:** As in ischemia but at younger age and more progressive.
- 3- **Neuropathic type:** There are large infected ulcers over pressure areas in the foot, e.g. the heel. Later severe distortion of the bones of the foot occurs with the development of **Charcot's joints** = deformed painless joint

Investigations:

- 1- Urine for sugar and blood sugar curve, culture and sensitivity for discharge.
- 2- Foot X-ray for osteomyelitis
- 3- In case of ischemic gangrene, as before in ischemia

Treatment:**Prevention:**

رجلك جوهرة

- 1- Proper control of diabetes.
- 2- Careful trimming of toenails.
- 3- Avoidance of tight shoes.
- 4- Early treatment of tinea pedis infection.
- 5- Avoidance of walking bare footed.
- 6- Daily foot care: Washing, drying, powdering & inspecting them for wounds or interdigital infection.

www.drbbacar.com**Treatment of stabilized cases:**

- 1- **Senile type:** Proper control of diabetes + treatment of atherosclerotic ischemia.
- 2- **Infective diabetic type:**
 - a. Proper control of diabetes.
 - b. Proper antibiotic after culture and sensitivity.
 - c. Excision of sloughs by experienced surgeon leaving well-drained raw area. Then frequent dressings are essential (repeated debridement and drainage of pockets is usually needed).
 - d. Amputation:
 - 1) Minor foot amputation if there is osteomyelitis.
 - 2) Urgent high amputation may be indicated.

↳ excision of dead tissues

Senile gangrenechronic atherosclerotic ischemia
→ gangreneIschemic Gangrene(Thrombotic Gangrene)**Etiology:**

- 1- Primary thrombosis: Rare.
- 2- The thrombosis is usually secondary to arterial disease such as senile atherosclerosis, diabetic angiopathy and Burger's disease

• Senile gangrene:

- The commonest variety in civil practice.
- Usually confined to lower limbs. The gangrenous process is usually precipitated by slight trauma.

Clinical picture:

- 1- **Incidence:** Usually in males, above 50 years, smoking, obese and diabetics. When it develops at an earlier age. It is generally associated with some predisposing causes such as diabetes, hypertension, hypercholesterolemia, nephritis or alcoholism.
- 2- **Stage of ischemia,** Stage of pre-gangrene, Stage of gangrene. (See before)

Investigations: (see before in ischemia)Treatment:

1- Stage of ischemia

- 2- **Established gangrene:** if possible, treatment of ischemia will lower the level of amputation:
- Care of the affected part by keeping it absolutely dry.
 - Wait for spontaneous separation in cases with limited sterile dry gangrene.
 - Amputation as before in ischemia.

Special typesTraumatic gangrenee.g. Bed sores
(Decubitus Ulcer)1- **Direct traumatic gangrene e.g. bed sores (Decubitus ulcers).**

They result from prolonged pressure, which deprives the tissue of its blood supply. They occur over bony prominences such as the sacrum, ischial tuberosities, trochanters, heels or scapulae.

Predisposing factors:

- Loss of sensation as in spinal cord injuries
- Bad general condition.
- Bad nursing of bed-ridden patient.

2- **Indirect traumatic gangrene is due to interference with the blood supply.**

شغوى

- Frostbite:** Severe cold → freezing of tissues → thrombosis of arterioles.
- Trench foot:** Severe cold to foot → spasm.

مهم جداً شغوى

Buerger's disease
(Thromboangitis obliterans)Definition:

Inflammation and thrombosis, of unknown cause, of small arteries & veins, with perivascular fibrosis which blends artery, vein and nerve into one mass causing early neuritic & severe rest pain.

شغوى
also Buerger's diseaseIncidence: (See before, the table)

Poor collaterals

distal obstruction

Clinical picture:

- Recurrent attacks of digital ischemia (Raynaud's phenomenon) and superficial thrombophlebitis. ①
- Chronic ischemia: as general, it is characterized by:
 - Claudication in sole only.
 - Early severe rest pain. & early-limited gangrene
- Distal arterial occlusion, with palpable popliteal pulse. ②

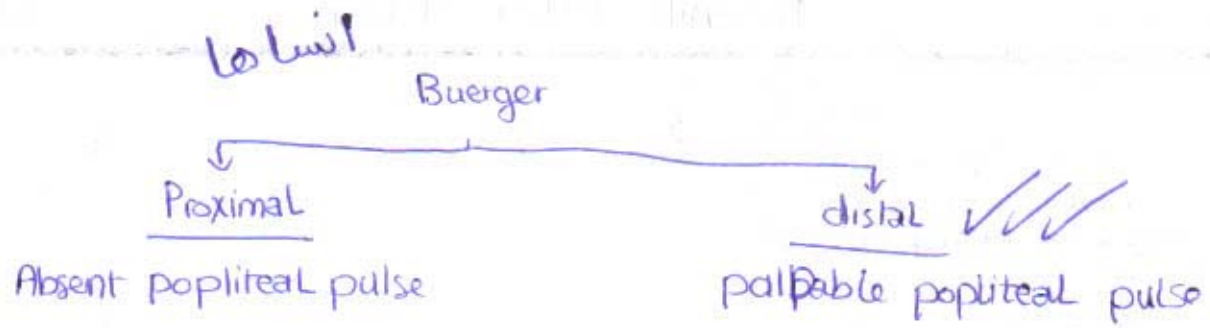
* Etiology

* Pathology

* Site of lesion

Treatment:

- Smoking must be stopped.
- Sympathectomy gives good results.



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هم جدا استفوی. مستبعد نظری Raynaud's disease

- Vasospastic disease affecting digital arteries. It affects young females in cold weather.

Cause: Unknown, may be direct arteriolar over sensitivity to cold, but not sympathetic over activity.

Clinical picture: affect arterioles not arteries in UL only

I- Cold precipitates attacks of 3 phases:

- 1- **Pallor:** from arteriolar spasm.
- 2- **Cyanosis:** Accumulating metabolites causing stagnation and cyanosis.
- 3- **Rubor:** As the attack ends, arterioles relax.

II- Between attacks, skin is normal.

III- In late cases trophic changes:

- 1- Superficial ulcers.
- 2- Dry gangrene of digits tips.

Treatment:

Is only successful in early cases before arteriolar obliteration and trophic changes.

I- Conservative for mild cases:

- 1- Avoiding cold.
- 2- Vasodilators.

Oversensitivity to cold
not sympathetic overactivity

II- Sympathectomy: (for severe cases):

Immediate results are good, but after few months mild sensitivity to cold returns. This partial relapse denotes that Raynaud's disease is not due to sympathetic over sensitivity but due to direct arteriolar over sensitivity to cold. Sympathectomy apparently raises the threshold at which spasm occurs.

- **Raynaud's Phenomenon:** يمكن تحصيلها الوجالة [Autoimmune Thoracic outlet Syndrome] لهذا سبب

Raynaud's phenomenon means similar digital vasospasm try to:

- 1- Occupations using vibrating tools, typists. Such patients are cured by changing their occupations.
- 2- Certain diseases:
 - a. Collagen diseases e.g. lupus erythematosus, and rheumatoid arthritis.
 - b. Atherosclerosis.
 - c. Burger's disease.
 - d. Scalene syndrome: Such patients improve only if underlying disease can be controlled.

ABC
Scalene

N.B. Raynaud's phenomenon does not benefit from sympathectomy.

N.B.:

- Causes of gangrene in U.L.: causes of ischemia in U.L.

- Thoracic outlet syndrome, Buerger's.
- Arteritis, Raynaud's

DSL

- D.M., Leprosy, syringomyelia. → Neuropathic gangrene
- Embolism, Trauma.

Vasomotor diseases

1- Raynaud's disease & phenomena.

- 2- **Acrocyanosis:** affects hands & feet, in female, on exposure to cold.

Cold test

أعمل للعبانة

أخليها تحط ايدها في طبق تليح

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D.D. from Raynaud's by:

- Extremities never completely normal,
- No blanching.

(مستش معحتاج Cold test) دائماً زرقة

Treatment: Conservative - Sympathectomy.

3- **Erythrocyanosis frigid (Bazin's disease):**

Affects fatty legs in female. Cyanosis from calf down with nodules & ulcers.

4- **Erythromyalgia:**

The warmth, the exercises & the dependency cause redness, warmth & burning pain, which are relieved by cooling.

5- **Causalgia:** See peripheral nerve injuries.

6- **Sudeck's atrophy:** See orthopedics.

Arteritis

1- **Buerger's.**

2- **Takayasu's arteriopathy:** Pulselessness diseases of female - autoimmune - treated by cortisone.

3- **Infective arteritis.**

4- **Endarteritis obliterans.**

5- **Polyarteritis nodosa.**

Extracranial cerebrovascular disease

اكتبه من الباطنة

It is the third leading cause of death and is a major source of disability among elderly people.

Pathogenesis:

- Embolization is the commonest cause of TIA's and ischemic stroke.
- The embolus may arise from the heart, but more commonly it arises from an ulcerating atherosclerotic plaque at the carotid bifurcation.

Clinical features

- Asymptomatic patients.
- Patients with TIA's.
 - Carotid artery TIA's (see internal medicine)
 - Vertebrobasilar TIA's
- Patients with stroke & residual neurologic deficits.

Investigations

- Duplex study of the extracranial cerebrovascular arteries.
- Arteriography is associated with a 1-2% stroke rate.
- CT scan of the brain

Treatment

Surgery

Carotid endarterectomy: The atherosclerotic plaque at carotid bifurcation is removed surgically.

Indications: in Internal carotid artery stenosis of 70% or greater in a patient with:

- Carotid artery TIA's.
- Stroke leaving minimal neurologic deficit.
- Asymptomatic lesion.

Medical treatment

Indications

- Less than 50% stenosis even if symptomatic.

Arterial Disorders

A.H.

2. Patients during the acute phase of a stroke. Revascularization is contraindicated as it leads to hemorrhage in the infarcted brain area.
3. Patients suffering from stroke with poor recovery.

Medications:

1. Antiplatelet drugs such as aspirin or ticlopidine.
2. Control risk factors.
3. Full anticoagulation in patients with cardiac embolic disease.

Subclavian steal syndrome

In this syndrome cerebral ischemia is caused by the reversal of flow in the ipsilateral vertebral artery distal to a proximal lesion in the first part of the subclavian artery

Clinical features

Vertebrobasilar insufficiency occurs on exercise of the upper limb due to increased demand for blood. The extremity steals from the cerebral circulation through the ipsilateral vertebral artery.

Investigations

1. Duplex scanning
2. Arteriography

Treatment

1. Carotid-subclavian artery bypass
2. Percutaneous transluminal balloon angioplasty (PTA) of subclavian stenosis

مختل نظر

Endovascular surgery

Endovascular surgery is the management of vascular diseases percutaneously through a puncture to deal with a lesion in a remote site.

Classification

System: Arterial or Venous

Purpose: Diagnostic or Therapeutic

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Therapeutic procedures

1. Angioplasty. 1, 2, 4, 5 → Chronic ischemia
2. Intravascular stents
3. Thrombolytic therapy → Acute ischemia
4. Atherectomy.
5. Peripheral laser angioplasty.
6. Endoluminal grafts in: Occlusive disease & Aneurysms → Abdominal Aortic Aneurysm
7. Inferior vena cava filters. D.V.T
8. Catheter vascular access

Balloon angioplasty (percutaneous transluminal angioplasty = PTA)

Indications: These are the same as those for conventional vascular operations.

1. Critical ischemia
2. Severe claudication that interferes with the patient's work and life style.

Ideal lesion

1. At least 5mm beyond origin of an artery.
2. Stenosis < 5cm length.
3. Best in iliac artery

Intravascular stent

Aim: may be inserted in the same session after PTA to prevent its drawbacks

Principle

- A metal vascular stent is guided over a guide-wire, endoluminally, and is directed to the arterial segment that has been dilated.
- The stent is carried over an expanding device that is kept closed until it reaches the desired site. The device is then opened to expand the stent so that it will fit in the artery

Types

1. Balloon- expandable stents.
2. Spring-Loaded, self-expanding stents
3. Thermal memory stents.

Inferior vena cava filter

Indications

- DVT or documented pulmonary embolism in a patient with a contraindication to anticoagulation.
- Recurrent & chronic pulmonary embolism despite adequate anticoagulation.
- Complications of anticoagulation that forced therapy to be discontinued.
- Failure of previous caval interruption, evidenced by recurrent pulmonary embolism.

Endoluminal grafts

Principle A combination of a stent with prosthetic graft positioned with a delivery system.

Uses

1. Exclusion of A.A.A.
2. Support of the intima of an artery after balloon dilatation in some cases.

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Venous:

written:- DVT

clinical:- VV

operative:- surgical H of VV.

anatomy:- venous drainage LL.

~~jars~~ & ~~xray~~.

Venous Disorder

Superficial vein thrombosis

(Superficial thrombophlebitis)

Etiology:

- 1- ~~Varicose veins.~~
- 2- ~~Cannulation for IV infusion.~~
- 3- ~~After injection of irritant drugs.~~
- 4- In association with:
 - (a) Buerger's disease (thrombophlebitis migrans).
 - b. ~~Polycythemia.~~
 - c. ~~Polyarteritis.~~
 - (d) Visceral cancer (may be the earliest sign of malignancy). → *Trousseau sign: superficial thrombophlebitis due to visceral cancer.*

Clinical picture:

- ~~The vein becomes red, painful & cord like.~~
- ~~Pyrexia.~~

Complications:

~~Spread to deep veins via the communicating veins. In this condition proximal ligation & disconnection should be done.~~

Treatment:

- 1- Compression by elastic stocking.
- 2- Anti-inflammatory drugs e.g. aspirin.
- 3- Antibiotics.

Deep Venous Thrombosis (DVT)

في غايه الاهمية نظري وشفوي

Incidence:

The true incidence of DVT is not exactly known as many cases pass unnoticed.

Predisposing factors:

1. Virchow's Triad:

a. Damage to the endothelial lining of the vein wall due to:

- i. Trauma to the vein wall, e.g. during pelvic operation.
- ii. Inflammatory process near the vein, e.g. pelvic sepsis.

b. Venous stasis due to:

- i. Prolonged recumbency, long trips or casts. *جلس*
- ii. Congestive heart failure.
- iii. Venous compression by tumors, pregnant uterus or pillows under the knees.

c. Hypercoagulability of blood due to:

- i. Antithrombin III deficiency.
- ii. Deficiency of proteins S & C, α_2 macroglobulins, α_1 antitrypsin & heparin cofactor which have an anticoagulant effect.
- iii. Polycythemia.
- iv. Malignancy. → *due to production of thrombogenic factors by some tumors.*



*سرعة بطيئة -
damage -
دم قليل*

*stasis
↑ coag.
damage*

*← اهم سببين
مزديكا*

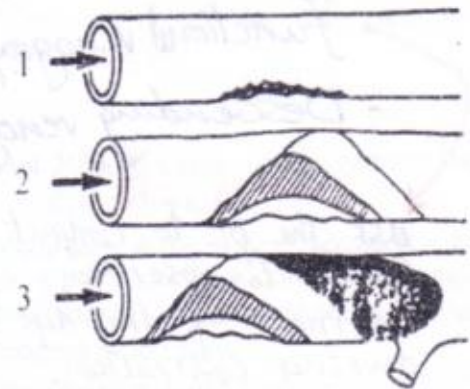
2. Added to these factors are:

- Fever especially typhoid. → *very high risk DVT → phlebitis.*
- Major trauma & malignancy.
- Obesity, old age & oral contraception.

Pathogenesis: (نظري وسفوي)

- 1- The process usually starts in the calf venous sinuses or in the iliofemoral veins by adherence of platelets to the endothelial surface forming a **gray cluster**.
- 2- Fibrin and R.B.C.'s are deposited as layers in-between the platelets giving a laminated appearance known as the **lines of Zahn**.
- 3- When the vein is totally occluded, a non-adherent, **jelly-like propagated thrombus** spreads up the vessel as far as the next major tributary. The thrombus is loosely attached and it can be easily detached leading to pulmonary embolism. → *أخطار مبركة*

Fig. (7)



- 4- Later, the thrombus becomes tightly adherent to the vein wall producing **destruction of the valves** and luminal occlusion.
- 5- Later on **recanalization** of the vein occurs but the valves are permanently destroyed. *after 3-6 mo.*

Clinical picture: ← *classical comp. asymptomatic***I- The Classical picture:**

□ There is triad of:

- 1- **Pain:** There is usually aching discomfort and tightness in the involved calf or thigh.
- 2- **Swelling:** It is the most reliable physical sign. It is evidenced by measuring the difference in the circumference between both sides. *بالمقارنة*
 - **The level of swelling in D.V.T differs according to the site of obstruction:**
 - In calf thrombosis the swelling is limited to the foot and ankle.
 - In femoral thrombosis the swelling involves the calf and lower part of the thigh.
 - In iliofemoral thrombosis there is massive swelling affecting the whole lower limb.
- 3- **Tenderness:** is present on compressing the muscles against the bones.

N.B.) Dorsiflexion of the foot causes pain in the calf in cases of D.V.T. (Homan's sign). However this sign is not reliable and may cause pulmonary embolism.

II- The complication group:

- 1- **Phlegmasia alba dolens:** Massive iliofemoral DVT may be associated with severe arterial spasm, so the limb becomes pale, white & massively swollen with absent peripheral pulses.
- 2- **Phlegmasia cerulae dolens:** Massive iliofemoral DVT may be associated with severe congestion and cyanosis and the whole lower limb looks massively swollen and blue and if not properly treated it may lead venous gangrene.
- 3- **Venous gangrene.**
- 4- **Pulmonary embolism** manifested by severe chest pain, dyspnea & hemoptysis. (Discuss).
- 5- **Postphlebotic limb.** (see varicose veins)

propagated thrombus.



1. Grey clusters; platelets.
2. Lines of Zahn: fibrin & RBC's on platelets.
3. Non adherent thrombus: so, can give rise to emboli.
4. Adherent: to the vein wall, no risk of embolism, but destruction of valves occur.
5. Recanalize after 3-6 months spontaneously.

المستفوي ، ويمكن تكتب في النظري .

- Phlegmasia alba dolens; means painful white swelling
- Phlegmasia cerulae dolens: Means painful blue swelling. «more dangerous than alba»

III- The asymptomatic group:

This is not uncommon. There are no local symptoms and the patient may present later with either pulmonary embolism or postphlebitic limb. However, it may be suspected by the presence of unexplained fever or tachycardia. → due to phlebitis.

Investigations:

As clinical examination is not reliable and incorrect in about 50% of cases. Investigations should be done before starting treatment. لازم ألون متأكد من التشخيص قبل بدء العلاج.

1- Doppler ultrasonography: (available - economic .. accurate .. safe ..) سونار (غنى للسونار) write with any U/S.

- Normally upon applying the ultrasound probe over a patent vein, a continuous sound is heard (venous hum). If the probe is applied over the femoral vein & pressure is applied to the calf, the hum gets changed into a roar due to increased blood flow.
- If there is thrombosis in the popliteal or femoral veins, the roar doesn't occur.
- **Advantages:** It is a simple & rapid method & is accurate in 80-85% of cases.
- **Disadvantages:** insensitive in calf vein thrombosis.

2- Duplex ultrasound: سمع وشوف

- **Advantages:**
 - This method combines doppler ultrasound flow analysis with ultrasound imaging.
 - Detects partially occlusive thrombi.
 - Its sensitivity & specificity reach 90-100% & most duplex errors are in below knee veins. So this test is the standard test for diagnosis of DVT and its accuracy approaches that of venography.

Doppler & duplex scan findings in case of DVT:

	Normal	DVT
Vein diameter	Normal	Dilated vein
Blood flow	Spontaneous	Poor
Echogenic material in lumen	None	Present
Distal compression	Augments blood flow	Poor augmentation
Blood flow with respiration	Phasic flow with respiration	Loss of phasic flow with respiration

3- ¹²⁵I-fibrinogen uptake depends upon the incorporation of isotope labelled human serum fibrinogen into the developing thrombus.

- **Advantages:** It is very accurate in the calf and lower thigh.
- **Disadvantages:** needs newly forming thrombus.

4- **Ascending venography:** although very accurate for the diagnosis, it is an invasive investigation & has been almost replaced by duplex scanning.

5- **Enhanced helical computed tomography (CT)** is the most recent diagnostic test. It shows the thrombus even in small veins. → doesn't mean it is the best.

6- **Other tests** as plethysmography & venous pressure measurements are of academic interest.

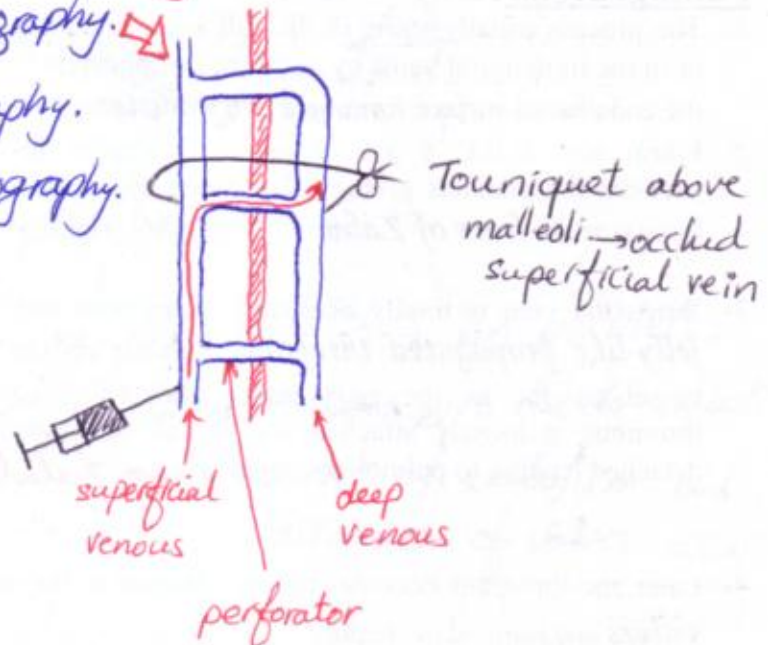
to Measure temp. of skin (↑ in DVT) higher in DVT.

Side

Types of venography

- Ascending venography. 
- Functional venography.
- Descending venography. 

ask the pt to contract the ms to observe the mov. of the dye during contraction.



Reach the IVC & inject the dye.

side: why can the tourniquet close superficial veins & not deep veins? [above malleoli].
→ Deep veins are present between 2 bones (tibia & fibula)

Side

Thrombophlebitis

- Manifestations: more prominent
- Risk of pulmonary embolism less

Phlebotrombosis

- Less prominent
- More.

(NB) DVT stimulate reflex arc → VC of artery.

- In DVT: if arterial spasm is very severe → phlegmasia alba dolens.
- DVT is diagnosed by investigations, not by examination.

- Doppler: sound only → سمع بس
- Duplex: sound + imaging → سمع و تصوير

Differential diagnosis:

- 1- Contusion of Calf muscles. تمزق في العضلات
- 2- Rupture of plantaris tendon (Venography & duplex may be needed to establish the diagnosis).
- 3- Lymphatic obstruction: The swelling is chronic and usually non-pitting.
- 4- Cellulitis: There are systemic & local symptoms & signs of inflammation. The leg is hot & red.
- 5- Acute arterial occlusion: There is more pain, no swelling, diminished sensations, lost pulse.
- 6- Ruptured Baker's cyst.

Treatment:

- **Prophylactic:** سؤال ب ١٠ درجات

- 1- Physical measures to reduce venous stasis. These include:

- a. Early ambulation after operations.
- b. Active leg exercises.
- c. Elastic stocking support
- d. Adequate postoperative hydration.
- e. Intermittent pneumatic external calf compression by special devices. «pneumatic bag»
- f. Elevation of the foot of the bed.

- 2- Prophylactic anticoagulation. In high-risk patients.

- a. **Low dose heparin (Mini Heparin)** 5000 IU subcutaneous 2 hours before operation and then every 12 hours until the patient is ambulant. Prophylactic heparinization should not be used if a large raw area is left after surgery.
- b. **Low molecular weight dextran** 500 ml IV/12 hours.

↓ platelet adhesiveness.

- **Curative:**

The objectives of treatment are:

- 1- Prevention of formation of new thrombi.
- 2- Prevention of pulmonary embolization.
- 3- To minimize venous valves damage.

A- Bed rest and elevation of the lower limb: (7-10) days

- ☐ 12-15 degrees above the level of the heart elevation reduces edema and pain and increases venous return.
- ☐ Application of an elastic bandage or stocking will also help venous return. Thrombi usually take 7-10 days to become adherent to the vein wall, the patient should be kept in bed for this period.
- ☐ Graduated ambulation with elastic support is then allowed. ممنوع منعا باتا يتولى من السرير

B- Anticoagulant therapy:

a- Heparin: (7-10) days

Action:

- 1) Enhances the activity of antithrombin III.
- 2) Neutralizes factors IX, X, and XI. immediate effect.
- 3) Mild activation of fibrinolysis.

Heparin is given until all signs of active thrombosis subside. This usually takes 7-10 days.

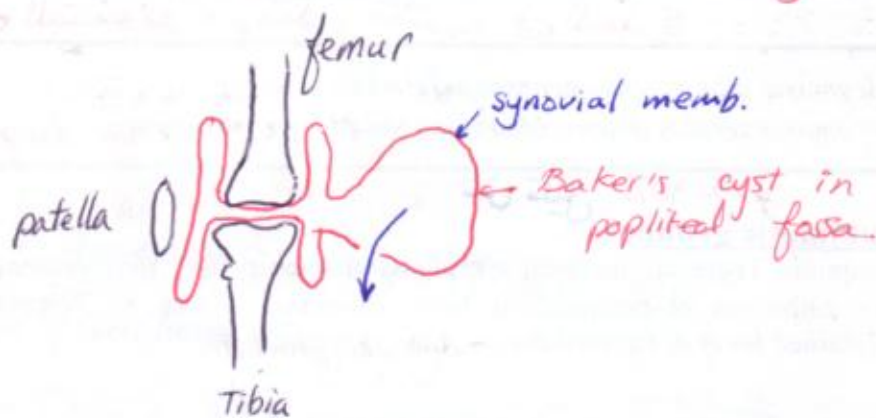
Heparin can be prescribed in one of 3 methods:

- ← 1) **Continuous IV infusion:** A bolus dose of 5000IU is given IV and then dextrose 5% drip containing heparin is infused at a rate of 20-30 IU of heparin/kg/hour. = glucose.

The best method

By special pump

Ruptured Baker's cyst



مادام ال DD مكتوب يبقى ممكن فلا
تلتخبط بينهم
(احترم ال DD المكتوب في الكتب)

1. Joint swelling	2. Pain	3. Redness
4. Warmth	5. Tenderness	6. Stiffness
7. Limited range of motion	8. Deformity	9. Systemic signs
10. History of trauma	11. History of infection	12. History of systemic disease

- 2) **Bolus therapy** 5000 IU intravenously every 4-6 hours.
- 3) **Subcutaneous method:** 150 IU/kg of claciparin (calcium salt of heparin) are administered subcutaneously every 12 hours. (150 IU s.c. / kg / 12 hr.)

The dose is monitored by:

- 1) Measuring the **activated partial thromboplastic time (APTT)**, this should be kept between 1.5 - 2.5 times the control values.
- 2) A more practical but less accurate method is to do **clotting time**.

Complications of heparin therapy:

- 1) **Bleeding** due to over dosage. It can be treated by giving protamine sulphate 1 mg IV for every 100 IU of heparin.
- 2) Failure to respond to heparin (**heparin resistance**): It may be mild and requires only increasing the dose of heparin.

b- **Oral anticoagulants (coumarin derivatives):** The most commonly used is warfarin.

Action: « compete with vit K »

Blocks the synthesis of at least 4 vitamin K dependent cloning factors (prothrombin and factors VII, IX and X), for this reason its anticoagulant effect is delayed.

Method and dose of administration:

An initial dose of 10 mg warfarin is followed by 5 mg daily dose. Heparin therapy must be continued in the first 3 days of treatment. Oral anticoagulants are given for 3 - 6 months, which is the time needed for recanalization and collateralization. In some patients who are liable to rethrombosis, warfarin is given indefinitely.

The dose is monitored by:

- The level of prothrombin concentration aiming to be 30 - 40% of control.
- Prothrombin concentration should be repeated every 2 weeks.

Complications of oral anticoagulants:

- 1- **Bleeding** is the main problem and is treated by vitamin K IV injection. In rare cases severe shock may occur form massive retroperitoneal hemorrhage. It is treated by fresh blood or fresh frozen plasma transfusion and vitamin K injection.
- 2- **Interaction between oral anticoagulants and other drugs** like aspirin, H₂ receptor blockers and non-steroidal anti-inflammatory agents leading to an increase in the anticoagulant effect.

• **Contraindications to anticoagulant therapy:**

1) **Absolute:**

- a. Trauma to or recent operation on the brain or spinal cord.
- b. Bleeding tendency.
- c. Septic phlebitis. (risk of septic emboli).
- d. Bacterial endocarditis.

2) **Relative:**

- a. Major visceral injury.
- b. Major acute fractures.
- c. History of cerebral hemorrhage.
- d. Hypertension where the blood pressure is higher than 180/120 mmHg.
- e. Peptic ulcer. due to bleeding from ulcer.

• Low Bolus therapy: every 2-4 hrs (not 4-6 hrs).

APTT: if more than 2.5 → spontaneous bleeding.

• clotting time: 8 min normal

• Needed clotting time with heparin therapy : 8 - 12 min.

• Normal prothrombin concentration: 100%

• Bleeding tendency: - when prothrombin conc reach 60% or less.

• spontaneous bleeding → 20%

• So aiming : prothrombin conc. should be bwn 20-60%.

• In brain : absolute

• Visceral or fracture: Relative

• Recent cerebral: absolute

• History of cerebral: relative

Relative < absolute ممكن تكتب اقله من

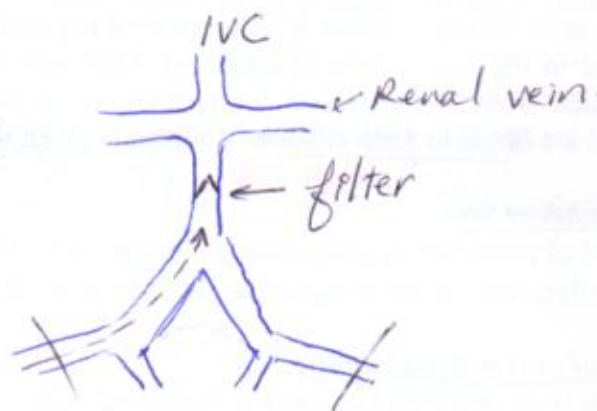


-venous thrombectomy:-

successful in 5-10% (Rethrombosis is very common)

-Temporary A-V fistula →

increase bl. flow in the vein & so
↓ incidence of rethrombosis.



• The clip doesn't prevent minor thrombi.
but prevent large thrombi that can cause death.

• Vena caval filter: placed below renal veins as
if occlusion of IVC occurred. There are many
collaterals.

While if occlusion of renal veins occurred
→ it has no collaterals, so, severe
renal congestion & RF occurs.

C- Thrombolytic therapy:

أدوية تلتف في حوريد

Action:

Fibrinolytic activators lyse fresh thrombi and may preserve the competence of venous valves. *Examples of fibrinolytic activators include:* streptokinase, urokinase and tissue plasminogen activator (TPA).

↳ less allergic reaction

but most expensive.

↳ from streptococci

↳ from urine

Complications:

- 1- Allergic reactions.
- 2- Severe bleeding.
- 3- They are very expensive.

D- Operative treatment:

In a small percentage of cases operation is necessary.

- 1) Venous thrombectomy using *Fogarty's venous catheter*.

Construction of a temporary small AV fistula may improve its results.

Indication of venous thrombectomy:

- Massive iliofemoral thrombosis. → death of limb
- Phlegmasia cerulæ dolens.
- Pulmonary embolism. → death of patient



Fig. (8)

vena caval filter.

- 2) Venous interruption:

Method:

- 1- A clip is inserted around the inferior vena cava (IVC) to convert its singlewide lumen into three small openings.
- 2- Insertion of venacaval filter.



Fig. (9)

Indications:

Cases with repeated showers of pulmonary emboli that do not respond to medical treatment.

• Axillary subclavian D.V.T.:

Etiology:

- 1) Spontaneous (primary). This is usually preceded by unusual muscle activity of the upper extremity (sports, or occupational) due to compression of the vein in the costoclavicular space.
- 2) Secondary due to:
 - Central venous catheters.
 - Metastatic tumors in the axilla.
 - Chemotherapy.
 - Hyperalimentation.

Clinical Picture:

- Pain and swelling of the entire upper extremity.
- Prominent venous collaterals over the shoulder and anterior chest wall.
- The limb may be cyanosed.

Surgical Physiology (مهم متفوی (مراجعة

Factors that help the venous return from the lower limbs:

The venous drainage of L.L. is carried out against gravity (from distal to proximal and from superficial to deep veins) by:

1- Muscle pump which needs strong muscles and intact deep fascia:

When the muscles contract within a tight deep fascia, deep veins are compressed → blood is directed towards the heart by competent valves. When muscles relax, pressure drops in the emptied deep veins → blood is sucked from the superficial veins.

2- The transmitted arterial pulsations to the venae commitants.

3- The unidirectional valves.

4- The negative intrathoracic pressure:

Pressure in the veins on dorsum of foot falls during walking to 30 cm H₂O from the resting venous pressure of 100 - 120 cm H₂O.

Varicose Veins Of The Lower Limbs

• short
• long
• متفرعة

Definition:

Dilated, elongated, tortuous superficial veins of the L.L.

Etiology & Types:

Primary V.V	Secondary V.V
<u>Two theories:</u> 1- Congenital weakness of the wall of veins → venous dilatation → valvular incompetence. 2- Congenital valvular incompetence. <u>Aggravating factors:</u> 1- Commoner in females. <i>high parity (progesterone has ms relax. effect)</i> 2- High parity. 3- Occupations requiring prolonged standing. 4- Constricting clothes.	<u>Secondary to one of the following:</u> 1- Deep vein thrombosis (the commonest cause). 2- Arteriovenous fistula, which may be congenital or acquired due to trauma or shunting for dialysis purposes → high venous pressure. 3- Compression of the deep veins by tumors or pregnancy.

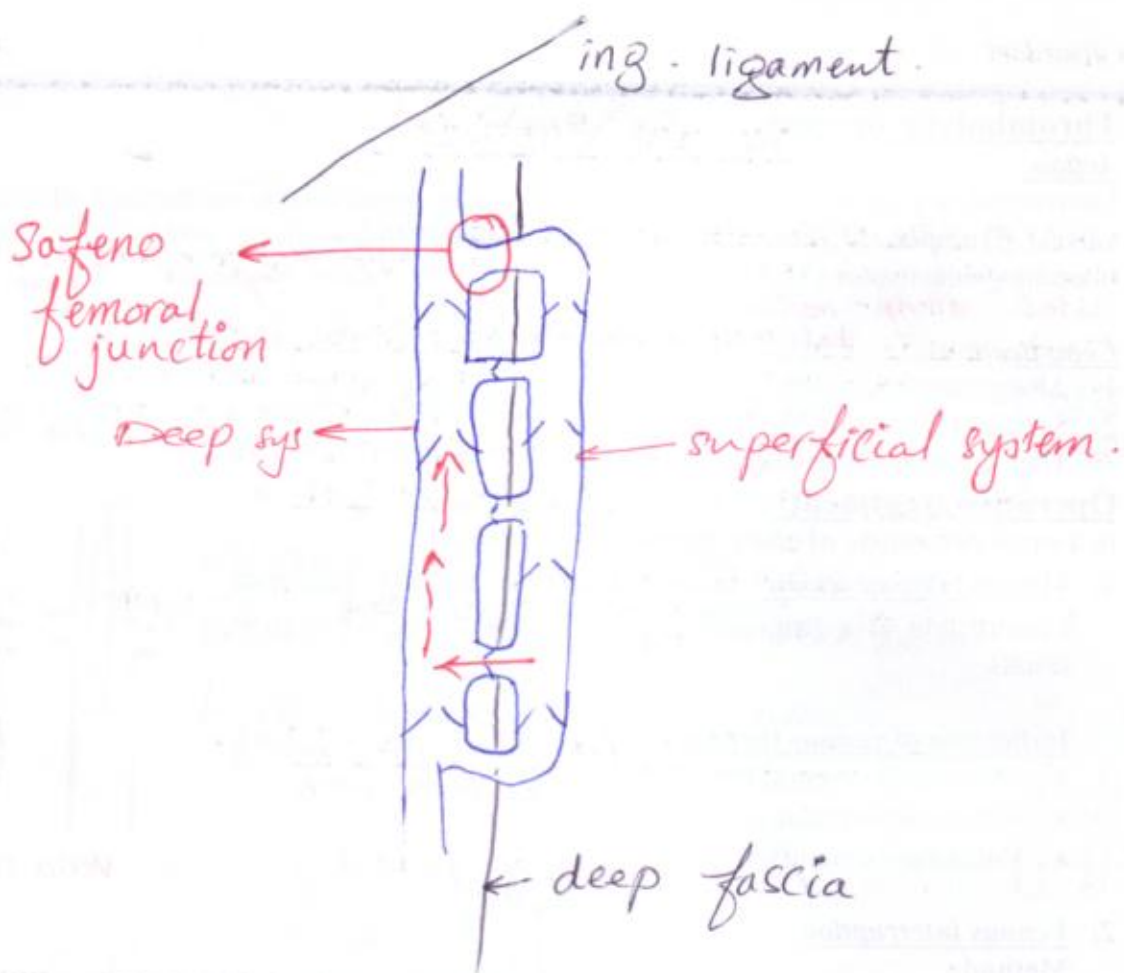
Gross picture (pattern):

- 1- Tubular type: dilated main veins (common in primary V.V).
- 2- Spider type: veins are thin and blue (dilated skin venules).
- 3- Serpentine: veins are coiled.
- 4- Saccular type: Blow out at the site of incompetent perforator with a palpable defect in the deep fascia opposite it. *Saphena Varix* is a saccule opposite an incompetent saphenofemoral junction. *clinically: Thrill impulse on cough. incompetent SF valve.*

Complications:

Complications are much more frequent with secondary varicose veins. *They include:*

- 1- **Edema.**
- 2- **Subcutaneous bruises** due to rupture of small veins as a result of venous hypertension.
- 3- **Itching, dermatitis & eczema** are due to deposition of hemosiderin in subcutaneous tissues.



• Causes of AV fistula

1. Congenital : associated with local gigantism.
2. Acquired : (trauma).
3. Induced : pt doing dialysis.

• 1ry VV:

- disease of superficial veins $\pm$ perforators
- "deep system is supported by ms."

• 2ry VV:

Disease of deep system reflected on superficial system through perforators.

- 4- **Liposclerosis:** The extravasated fibrinogen leads to fibrous tissue formation. The soft subcutaneous fat is replaced by tough fibrous tissue
- 5- **Recurrent superficial thrombophlebitis.**
- 6- **Venous ulceration.**

The combination of the above mentioned complications, together with chronic leg pain constitute the **post-phlebotic syndrome** as they usually follow previous deep vein thrombosis with incompetent perforating veins.

- 7- **Hemorrhage** may occur due to rupture of varicose veins.

« Pt bleeds from his heart »

سؤال مهم: متى في كتاب الفهم

- **Long Saphenous vein** is the longest vein in the body and the most commonly affected by V.V.
- **V.V. is commonest in lower limb: Why?**
 - 1) Marked length of veins.
 - 2) Vertical position. → dependent.
 - 3) Large volume of blood they contain.
 - 4) The liability of compression by abdominal mass (e.g. uterus).

Clinical Picture:

A. Primary varicose veins	B. Secondary varicose veins
Patient	
• Occupation with prolonged standing or sitting • Positive family history in 50% of cases.	• Females with repeated pregnancy, abortion, prolonged intake of oral contraceptives. • Patients with dehydration (prolonged vomiting or diarrhea), prolonged recumbency or prolonged fever.
Symptoms	
1- Cosmetic disfigurement.	
2- Pain (venous pain):	
Mild	Marked
It is dull aching, heaviness or bursting in character, increased by prolonged standing or sitting and relieved by elevation of the L.L. and walking, <u>walking aggravates pain</u> if there is:	
1- Incompetent perforators → high venous pressure on walking (up to 150 mmHg).	
2- Associated ischemia or	
3- Active D.V.T. with occluded deep veins.	
<i>avoided by elevation of ll.</i>	
<i>← 3- Night cramps « due to accumulation of metabolites during day time »</i>	
4- Swelling (edema):	
• Slight ankle swelling that resolves after night sleep.	• Persistent diffuse swelling of the L.L. does not resolve by night sleep.
5- Skin Complications:	
• Less common.	• More common.
Past History	
• Nothing related.	• D.V.T. • Stab or bullet (A-V fistula).

post phlebotic limb syndrome =
complicated 2ry VV

- To stop bleeding in VV $\rightarrow$ elevation of legs.

sig $\rightarrow$ 1ry VV is more on the lt side due to:-



- left common iliac vein is crossed
by right CIA $\rightarrow$ pressure is slightly higher
in left side more than right side.

Signs	
a- General Examination	
There may be flat foot, hernias, kyphosis, varicocele or piles (congenital mesenchymal weakness)	• Pelvic or abdominal tumor, pregnancy. • Scar of pelvic operation. • Pulse & B.P. changes in A - V fistula. <i>→ Hyperdynamic Circulation</i>
b- Local Examination	
Inspection:	
1- The V.V. are multiple, dilated, elongated, tortuous, bluish swellings along the course of veins of the L.L. 2- Usually bilateral unequal. 3- Affect long or short Saphenous veins or the communicators. 4- V.V. never crosses the groin. 5- The veins are mainly tubular. 6- Minimal pitting ankle edema may be present. 7- Skin complications are less common.	• Usually unilateral. • Affect any vein or venule in an irregular distribution and may extend to the abdomen • V.V. crosses the groin in cases of iliofemoral or I.V.C. obstruction. • Mainly serpentine or spider-like. • Diffuse massive edema of L.L., which becomes hard & non-pitting in chronic cases. • Skin complications are more common.
Palpation:	
1- Dilated, elongated, tortuous, soft, compressible tubules. 2- While the patient is lying down, a defect is felt in the deep fascia opposite each blow out (incompetent perforator) (<i>Fegan's method</i>). 3- Incompetent saphenofemoral or saphenopopliteal junction shows expansile impulse and thrill on cough. 4- Saphena varix is a soft cystic compressible swelling with impulse and thrill on cough. 5- Palpate the V.V. for firm tender nodules (superficial thrombophlebitis). 6- No spontaneous pulsation, thrill, murmur or local gigantism.	• Spontaneous pulsations, murmur and thrill & local gigantism in case of congenital A-V fistula.

→ aetiology: look for AV fistula → نقرص او كدمات

Special tests: See clinical notes.

Investigations: *تشخيص*

The aim is detection of the sites of incompetent communicating veins and to verify the patency of the deep veins. It should be noted that most cases of primary varicose veins require no investigations because careful clinical assessment provides enough information.

1- Duplex ultrasound imaging.

2- Venography:

• Values: It shows:

- 1- Patency and size of deep veins.
- 2- Presence of valves and any incompetent perforator.

• Method:

- A tourniquet is applied above the malleoli to occlude the superficial veins.
- Inject the contrast material into a superficial V. on the dorsum of foot and serial X-ray films are taken.

3- In case of varicose ulcer:

Plain X-ray (if periostitis is suspected) and biopsy (if malignancy is suspected).

Local examination of VV

inspection

palpation

VV

VV

Extent
& pattern

Fegan's method.

تج

تج

Comp.

Comp.

Aetiology

Aetiology

DD

DD

D.D.: قزادة

- 1- Other causes of leg pain.
- 2- Other causes of leg swelling.
- 3- Other causes of leg ulcers.

Treatment:1- Conservative treatment: For indications mild cases.

a) Secondary varicose veins: If deep veins are occluded, the only treatment is conservative. If deep veins are patent (canalized deep vein thrombosis), still conservative treatment is essential, but injection or operation can be added if varicose veins are large or complicated.

b) Primary varicose veins: If very early or patient is pregnant, unfit for, waiting for or refusing operation. **Conservative treatment includes:**

- i. Below knee elastic stocking or crepe bandage to support superficial veins, to prevent reflux from deep veins thus helping leg muscle pump and to prevent edema.
- ii. Periodic leg elevation to prevent stasis and congestion.
- iii. Regular exercises to restore muscle tone.
- iv. Long sitting or standing is avoided, but walking is encouraged.

2- Injection treatment: (Compression sclerotherapy)Indication:

- i) Early cases of 1st V.V., which come for cosmetic reasons.
- ii) Residual V.V. after operation.
- iii) In secondary varicose veins, it can be done if deep veins are patent.

Methods of injection compression sclerotherapy:Aim:

Sclerosants like 5% ethanolamine oleate or 3% sodium tetradecyl sulphate if injected in an empty vein leads to injury of the endothelial layer of the intima. If compression is then applied, the two walls of the vein will adhere together leading to **obliteration of the vein by fibrosis and not by thrombosis**. If injection is done with the vein full of blood, thrombosis will occur which later recanalizes with recurrence of varicosities.

Technique:

- 1- A venous tourniquet is applied over the thigh while the patient is standing and the site of the vein is identified and marked on the skin by a skin marker.
- 2- The patient is asked to lie down and a thin hypodermic needle is inserted into the vein.
- 3- An assistant then elevates the limb and 1ml of the sclerosant material is injected.
- 4- Immediately after application of bandage, the patient is instructed to walk for a long distance in order to flush any amount of sclerosant that might have reached the deep veins.

Complications:

- i- Extravasation leads to sloughing of the skin and poor cosmetic results.
- ii- Deep venous thrombosis may occur if a large amount of the sclerosant material reaches the deep system undiluted so no more than 1 ml is injected at any point and no injection is done for veins above the knee.



##

١٤٧٧٧ →

بعد العملية يرجع انسان طبيعي

١٠٠٪

Conservative ولا يحتاج

as the valves of deep system are intact.

2ry VV:

Chronic venous insufficiency
(chronic venous HTN)

- Before recanalization:

surgery & injection are contraindicated

- only conservative tt.

After recanalization

• U can do injection or surgery accomp. by conservative.

لازم يعطى بالشراب

as the valves are damaged in deep venous system.

مواقع sites of VV in body

①* LL ②* esophagus (varices) ③* Spermatic cord (varicocele)

④* Anal canal (anorectal varices) ⑤* Umbilicus (caput medosae).

⑥* piles

⑦ UL when? after AV fistula of renal dialysis.

للحياة:

• الشراي المريض يلبسه وهو نازل من السرير، ويقلمه وهو طالع السرير.

للحياة:

- Any condition has conservative & surgical ttt
→ we start conservative & then surgery if → failure of cons.
↓ complications.

• Precautions to avoid DVT in injection:-

1. Tourniquet above knee.
2. No more than 1 mL is injected.
3. No injection is done for veins above knee.
4. Pt is instructed to walk for a long distance.
5. Not done in contraind pt e.g. pills.
« before injection ask the pt abt use of oral CCP.»



communicators (indirect perforators).

Direct perforators (or perforators).

- No comp. occur above the knee as the perforators are indirect.

- Below the knee → perforators.

⊗ There are 3 fixed perforators at:

2
4 } inches above med. malleolus.

3- Surgical treatment: (see operative notes)

Indications:

- 1- Large 1^{ry} V.V.
- 2- ~~Incompetent valves of long Saphenous or short Saphenous.~~
- 3- Presence of complications.
- 4- ~~Cosmetic reasons.~~
- 5- In secondary varicose veins, it can be done if deep veins are patent (canalized deep vein thrombosis), but just in addition to conservative treatment.

Management of complications: e.g.:

- 1- **Varicose ulcer:** see later.
- 2- **Hemorrhage:** Elevation and pressure bandage.

Varicose (Venous) Ulcer

Definition:

It is chronic leg ulcer complicating 2^{ry} V.V. usually in post-phlebotic limb, much less common with A-V fistula. (No ulcer in 1^{ry} V.V.)

It is due to: incompetent ankle perforators causing reflux of blood from deep to superficial veins with consequent maximal congestion leading to anoxia. Thus skin vitality at ankle is reduced. Ulceration usually occurs above medial malleolus (*ulcer bearing area*). If it heals, recurrence is common until something is done to correct reflux and venous hypertension at ankle. Excess fibrosis makes its base and edge hard (callous) and such ulcer resists healing (indolent).

Clinical picture: Postphlebotic syndrome.

Characters of venous ulcer:

- 1- At medial malleolus (*ulcer bearing area*) as the skin of the lower part of the leg is drained directly by the perforators, which drain into the deep system.
- 2- Margin shows varicosities, edema, brown pigmentation, eczema and itching marks.
- 3- Base is tender, soft if recent and hard if chronic, may become fixed to tibia, and underlying periosteitis may produce thick tender bone.
- 4- Limb examination reveals all manifestations of postphlebotic syndrome and firm tender inguinal nodes.

The Ulcer is chronic due to:

- 1- Tissue anoxia due to venous stasis and impaired nutrition.
- 2- Chronic irritation by hemosiderin (eczema).
- 3- Superadded infection.
- 4- Superadded periosteitis.
- 5- **Liposclerosis:** the fibrin acts as a barrier to O₂ and nutrients.

D.D.: Other chronic leg ulcers.

Complications: (as any chronic ulcer)

- 1- **Malignancy:** Marjolin ulcer. *Better than carcinoma denovo as fibrosis delay lymphatic Blood, direct spread.*
- 2- **Periosteitis:** Suspected if ulcer is fixed to tibia, which is thick and tender.
- 3- **Talipes Equinus:** May complicate varicose ulcer as walking on toes decreases the pain.

Treatment: Physiotherapy.

planter flexion & inversion.

Investigations: For suspected complications (not routine)

- 1- **Biopsy** for suspected malignancy.
- 2- **X-ray** for suspected periosteitis.
- 3- **Venography**: if surgery is indicated.

Treatment:**A- Conservative: For all cases.**

ممكن يروح بيته ويحيى الحياة

- 1- If very small uninfected and not associated with severe edema, they can heal with ambulant conservative measures.
- 2- If large or infected or associated with severe edema or ambulant treatment failed, patient must be hospitalized for bed rest.

It includes:

متراب ويرفع
رطيله
ونقير على
ulcer
saline →

- a- ~~Elevation of the foot in bed.~~
- b- **Ulcer care**: Moist saline dressings. The use of topical antibiotics aggravates the condition by inducing allergic reaction.
- c- ~~Elastic stocking or crepe bandage.~~

Conservative treatment is usually successful in allowing the ulcer to heal, however, once the patients return to normal activity, most ulcers will recur.

B- Surgery is indicated for resistant chronic ulcers and for recurrent cases:

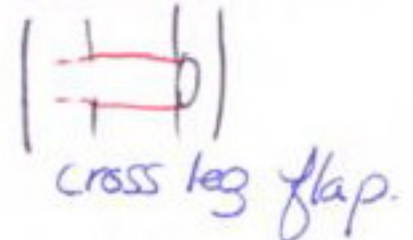
- 1- If the problem is just incompetent perforators, subfascial ligation of these perforators (**Cockett's operation**) is the procedure of choice.

Endoscopic subfascial ligation is now gaining popularity.

من وضع قطعه
axillary vein
مكان الصرير الى
valves
بازن فيه

- 2- If the problem is stenosis or valvular incompetence of the deep veins, reconstruction of the affected vein is considered. Such operations are relatively new and are accompanied by a high failure rate. فاشلة
- 3- Covering ulcer by split thickness (**Thiersch graft**) or by cross leg flap: In callous ulcer, excision is done before putting graft. نرس

N.B. After treatment, patient will use elastic stocking indefinitely.

**C- Treatment of Complications:**

- 1- Malignancy = Excision with safety margin or amputation.
- 2- Periosteitis = Saucerization.

Clinical Chronic Leg Ulcers → معانات ليس في كتاب القسم

Classification: (General)**1- Non-specific ulcers:**

- a- **Traumatic**: Due to direct destruction of surface epithelium by mechanical, thermal or chemical trauma.
- b- **Infective** e.g. pyogenic.
- c- **Vascular**: Due to arterial obstruction (ischemic) or due to venous cause (varicose ulcer).
- d- **Trophic**: Due to loss of vasomotor supply (due to destruction of local nerve supply).

2- Specific: T.B., syphilis.**3- Malignant: Epithelioma, fungating sarcoma.**

- complications occur above malleolus :-
due to presence of fixed perforators
above medial malleolus.

→ so, the patient uses the elastic
stocking below the knee.

سؤال: Is there complications at lateral malleolus?
- It occurs only if there is lateral
perforators.

سؤال: Why the area above medial malleolus
is the ulcer bearing area??

1. This area is drained by direct
perforators.
2. Superficial system of this area
is drained directly into the deep
system.
3. The high pressure in deep system
is transmitted directly into the
superficial system.

Causes of chronic leg ulcer:-

1. Traumatic
2. Inflammatory specific : TB, syphilis
Non specific
3. Neoplastic = SCC
4. Miscellaneous : VAN &

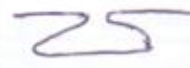
سؤال ^{there is} Why chronic traumatic leg ulcer & No chronic ^{haemolytic anaemia} traumatic arm ulcer?

1. Dependency & congestion in lower limb.
2. liable for trauma (repeated)
3. Liable for repeated infections.

Types of edges:-

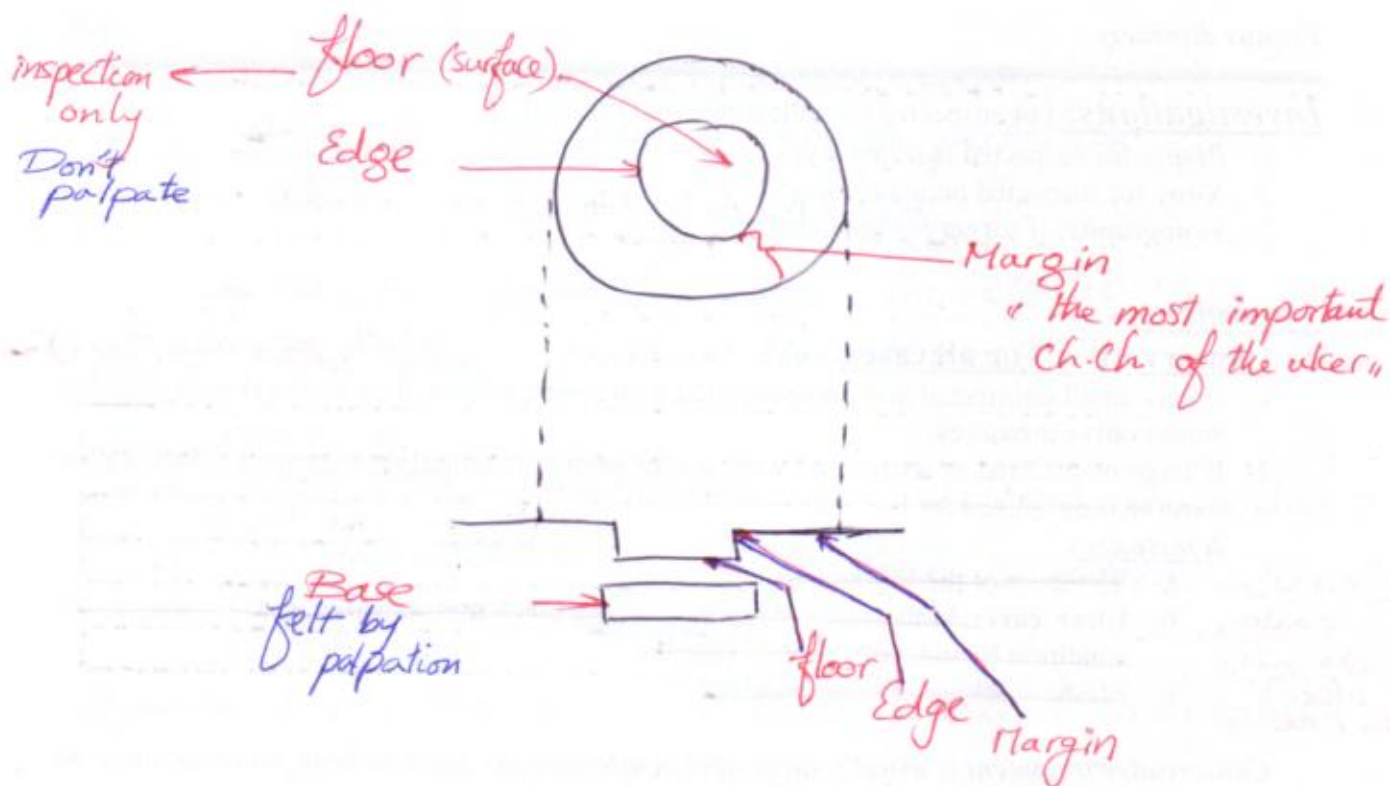
① Punched out  due to rapid loss of tissues.

② Sloping  Healing ulcer

③ Undermined: (eg. TB.) 
More loss in SC than skin
as (TB affect lymphatics in SC tissue & submucosa more than skin & Mucosa).

④ Raised everted edge (eg. carcinoma) 
Due to rapid growth of tissues.

⑤ Rolled in edge: (Basal cell carcinoma) 
Due to trials of healing
« also called beaded due to fibrosis due to trials of healing ».



Inspection of ulcer:

4 S

site
size
shape
surface

M E D

Margin
Edge
discharge

2 S

surrounding: MS
other sw: VAN
LN

Palpation of ulcer:

T E B

• Tenderness
- Edge
• Base

2 S

• surrounding esp. pulse
may be
Ischaemic
ulcer
• other sw: Z/I.

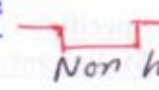
well

ulcers: specific: has a pathology in biopsy.

- Non specific: has no pathology in biopsy @ Venous & Ischaemic ulcers

General ch.ch:-

① Floor: granulation tissue [healthy or unhealthy].

② Edge: sloping  @ punched out  Non healing.

③ Base: Early: soft
Late: indurated (callous, indolent)

1- Traumatic Ulcer: *General features*

It is due to direct destruction of surface epithelium by trauma with secondary infection on top.

- At first the ulcer is **acute** and **painful** with **congested edge** and **discharge is purulent**.
- In healing stage, the floor is covered by either healthy or unhealthy granulation tissue and edge is sloping.
- If the ulcer becomes **chronic**, the base becomes indurated with pale granulation, the discharge is sero-purulent and the ulcer becomes fixed.

Healthy granulations	Unhealthy granulations
Red	Pale
Finely granular flat surface.	Coarsely granular raised surface
Does not bleed easily	Bleeds easily.
Minimal serous discharge	Profuse pus discharge.
Painless ulcer	Painful ulcer.

• Treatment:

- Rest, elevation, dressings and antibiotics.
- Grafting may be needed.

2- Varicose Ulcer (see before)

3- Arterial (Ischemic) Ulcer:

4- Trophic Ulcer:

It occurs in an area deprived of its nerve supply due to C.N.S. disease or peripheral nerve lesion. The foot is anesthetized, and the patient is unaware of trauma causing ulceration.

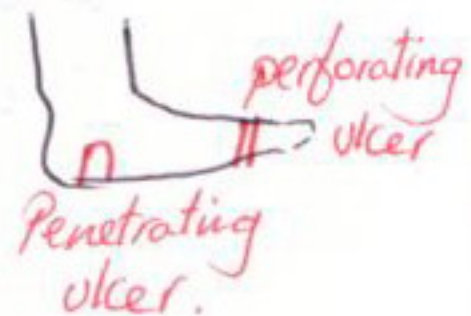
Site: Opposite the head of first or 2nd metatarsal bone or opposite the heel.

Size: Variable but it may penetrate deeply or even perforate the foot to appear on the dorsum changing into perforating ulcer.

Margin: ~~Skin cornified forming a callosity~~. Skin is insensitive to pain.

Treatment:

- 1- Conservative: rest, elevation and dressing.
- 2- Excision of the callosity track, and base.
- 3- Amputation if many tarsal bones and joints are diseased.



5- Syphilitic Ulcer:

Site: Upper outer part of leg (opposite head of fibula).

Base: indurated. Characteristically it is painless.

6- T.B. Ulcer: *severely painful*

Usually secondary to T.B. osteomyelitis or arthritis. Ulcer is shallow with undermined edge, thin cyanotic margin, soft base, pale anemic granulation tissue at the floor.

as TB toxins have VC effect.

7- Malignant Ulcer:

- Epithelioma either arising de novo or on top of chronic ulcer.
- Malignant melanoma.
- Fungating sarcoma.

8- Lymphedema Ulcer (see later)

9- Blood Diseases: e.g. Sickle cell anemia.

Management

I - Prophylactic		II - Curative	
1. Physical measures	2. Anticoagulation	1. Bed rest	2. Anticoagulant
↓↓ Venous stasis	(in highly risk patients)	1. Elevation of L.L.	a - Heparin
1. early Ambulation after operation	obese (رجل عجوز) hysterectomy عملته (Pills وبيأخذ)	12°:15° above level of the heart ↓↓ [edema-Pain] ↑↑ [VR]	1. ↑↑ activity of Antithrombin III 2. Neutralizes IX, X, XI [Immediate] 3. mild activation of Fibrinolysis
2. intermittent Pneumatic external Calf Compression by special devices	1. Miniheparin 5000 IU S.C. 2h before & 112h after until ambulant • not used if large raw area is left after surgery. [Diaphragm من Spleen تسليك]	2. Elastic stocking • help VR • Kept in bed 7-10 days [until thrombi become adherent to vein wall] بيبي في السرير نخرمله السرير مدفوق ومن تحت	7:10 days «all signs of active thrombosis Subside» 1. Continuous IV infusion «no fluctuation» الأفضل • Bolus dose 5000 IU IV. then • dextrose 5% drip containing heparin 20-30 IU/Kg/h 2. Bolus therapy بتلعة امتياز 5000 IU IV/4-6h (2-4h ليلية) 3. S.C. method 150 IU/Kg/12h S.C. Calcic heparin (Ca salt of heparin) البلدي في Na مش Ca
3. elastic stocking support	4. Adequate Post operative hydration	3. Gradual Ambulation with elastic support is then allowed	1. APTT 1.5 : 2.5 times normal 2. Clotting time N = 8 min. 12 < Aim < 20 الامتياز (more practical - less accurate) حيلة
5. active Leg Exercises	2. LMW Dextran 500 mL IV /12h prevent platelet adhesion		1. Bleeding: overdose ttt protamine sulphate 1mg/100IU heparin or protamine zinc insulin + glucose 2. Heparin resistance = failure to respond أدبه لوان ومضامة وشيبي أحسن may be mild → need only ↑↑ dose
6. elevation of the Foot of the bed			1. Trauma / recent operation in brain or sp. cord → Intracranial Hge 2. Bleeding tendency 3. Septic phlebitis 4. Bacterial endocarditis } → risk of septic emboli
			Contraindications of oral anticoagulation Absolute

Thanks to A.H.: The Man Of The System , The System Of The
By: Mahmoud Kenawi 2007/2008

of DVT

- Prevent Formation of new thrombi
- prevent pulmonary embolization
- minimize venous valve damage

therapy

b. Oral anticoagulants (Cumarine derivatives)

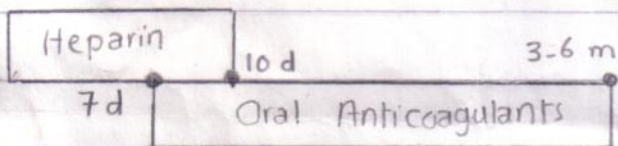
Block synthesis of 4 Vit. K dependant clotting factors II [prothrombin] VII, IX, X

Delayed effect (المخزون يخلص في 3 أيام) (مضاع الرز)

3-6 months

time needed for canalization & collateralization
* Patients liable to rethrombosis given indefinitely
الممر كله

Heparin continued in the first 3 days



- * Initial dose 10 mg Warfarin
- * Then 5 mg daily dose

Level of Prothrombin Concentration

N = 100%

$20\% < Aim < 60\% = 30-40\%$
repeated every 2 weeks

1. Bleeding: ttt: IV Vit K Injection
massive retroperitoneal hge → severe shock (rare)
ttt: fresh blood or fresh frozen plasma transfusion + Vit K injection

2. Interaction with other drugs:

↑↑ anticoagulant effect

e.g. Aspirin - H₂ blockers - NSAIDs

كأنه واحد V أقراص Oral Anticoagulant

Relative

1. Major visceral injury
2. Major acute fracture
3. History of Cerebral Hge
4. Peptic ulcer
5. HTN > 180/120 mmHg (Liable to stroke → Intracranial Hge)

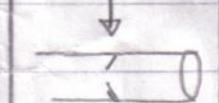
3. Thrombolytic therapy

Fibrinolytic Activators

- Streptokinase
- Urokinase
- TPA

Advantage

ايه تتلق في حري
مخلات حاجة للجراحين غير
طهارة العبال... ناقص المين
تعمل ليزر يطهر النبال بعد
فيه الكيل يطلع مظهر
ويشغل أكسنة يا عريس يا صينير



Lyse fresh thrombi & preserve competence of Valves Venous valves

Complications

1. Allergic reaction
2. very Expensive
3. severe Bleeding

نزيف مجرم
من كل حنة
[مناخره - بقة]
بطنة - ورنه -
شعره - ضوافره
- آبه - خطيقت -
أي حد يبي جنبه

4. Operative treatment

a. Venous thrombectomy

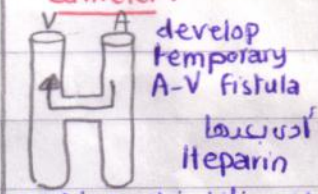
b. Venous interruption

Indications

1. massive iliofemoral thrombus
2. Phlegmasia cerulea dolens
الرجل هنفوت
3. Pulmonary embolism
العين هيموت
4. الجراح شاطر
5. الجراح محتاج فلوس

Cases of repeated Showers of pulm. emboli not responding to medical ttt
كل يوم يقول أي يجيله embolism
1. اول يوم: اتحرك
2. ثاني يوم: الامنيار مياوش
Anticoagulant
First line of management
اشتر الامنيار
3. ثالث يوم: جنبته امتياز
بانا بيحقن بالراحة
4. حتى في الانكسك كبر
وهو رافع رجليه جاله emboli

Fogarty's Venous Catheter:



develop temporary A-V fistula
أدي بعدها
Heparin
احمد ربنا ان عندك رجل فيها دوالي

1. Insertion of Venacaval Filter



Green Field Filter

* In Arterial embolism within 6 hours
emolus تشيل بيها
Success 95% rapid flow

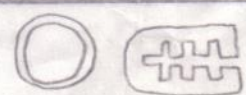
* In DVT
Success 5-10%
Flow مابض - عرة

[عشان كده البنت بتاعة
Phlegmasia cerulea dolens
اللي جوز النبال طلقوا قبل
العملية ملحقها ماش]

تحت ال renal vein
لوفيت وانا باع Sonar ان IVC
مسدود - emboli أنبي في مشون
السكارة
اكان زمان متب من مشون
5. Collaterals هتشيل الليلة
برقية Collaterals of Aorta
Femoral & Popliteal
جامة 8 So IVC collaterals
[Risk of gangrene in femoral obstruction > obstruction of Aorta]
تحت ال renal vein
ملوش Collaterals

2. Clip inserted around IVC
to convert its single wide lumen
into 3 small openings
ممكن تعدى small emboli

Man ...!!! وهماو السيستم قد عاد اليكم مرة أخرى



Lymphatic Disorders

Acute Lymphangitis

Clinical Picture:

Fever, rigors and general constitutional disturbances may be very severe. Locally, there is pain, edema and red tender streaks. The regional lymph nodes are enlarged and tender.

Treatment:

- 1) Treatment of the cause.
- 2) Antibiotics, especially penicillin and broad-spectrum antibiotics.
- 3) Local rest of the affected part, and local heat to help resolution.
- 4) If suppuration occurs, it needs an incision.

Lymphadenopathy

The causes of lymph node enlargement are:

1) Inflammatory:

a. Acute non specific:

- i. Septic lymphadenitis. سطرورنص
- ii. Infectious mononucleosis. + Biopsy مشخصاتش

b. Chronic:

- i. Non-specific. سطرورنص
- ii. Specific: سطرورنص
 1. Bacterial: T.B., S.
 2. Parasitic: Filarial. سطرورنص
 3. Viral: Lymphogranuloma inguinale, cat scratch disease, AIDS.
 4. Protozoal: Toxoplasma.

2) Lymphomas:

- a. Hodgkin's lymphoma.
- b. Non-Hodgkin's lymphoma.

3) Blood Diseases:

- a. Acute leukemia.
- b. Chronic myeloid leukemia.
- c. Chronic lymphatic leukemia.

4) Lipoidosis.

5) Metastases.

6) Collagen diseases.

Acute Septic Lymphadenitis

Clinical picture:

- 1) The picture of the causative lesion.
- 2) General constitutional manifestations.
- 3) Locally the nodes are enlarged, red, hot, tender, firm or soft and if suppuration occurs fluctuation will be evident.

Treatment:

- Treatment of the causative focus.
- General rest and antibiotics.
- If an abscess forms, incision & drainage.

* Written

lymphadenopathy - لیمفائیٹس } TB
 Lymphoedema } لیمفوما

* Clinical

lymphadenopathy
 Lymphoedema

* Jar

lymphoma کثیر
 T.B L.Ns جار

* AXray , anatomy

* Operative: ttt of Cold abscess سورجیکل

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Chronic Non-Specific Lymphadenitis

Clinical picture:

السطر
وغير

Common in the submandibular and inguinal lymph nodes. The nodes are slightly enlarged, mobile, discrete, slightly tender and firm in consistency.

تخلق شفرة .. تحط حاز في شفرها
علاج السبب
يكون حاجة في رجليه
chronic pharyngitis

Treatment:

- This is directed to the original focus. The nodes need no treatment.
- XXX If a case of chronic nonspecific lymphadenitis which persists for more than 3 or 4 months tuberculosis must be excluded.

Tuberculous Lymphadenitis

Incidence: Usually affects children & young adults.

T.B ماعدا اسطمية في اى

Bone → Children بس
Kidney → young adults بس

Etiology:

- Predisposing factors:** Poor general resistance.
- Organism:** Mycobacterium tuberculosis.
- Pathological Types:**
 - Lymph born type: The commonest.
 - Blood born type.

مش اسطمية

اسطمية

Pathology:

A- Gross picture:

1- Lymph born (fibrocaseous) type	2- Blood born (lymphadenoid) type
1- Primary infection.	1- Secondary to active T.B. focus in the body
2- Affect a localized group of L.N.s.	2- Affect multiple groups of L.N.s
3- Initial lesion occurs in the cortex → T.B. peradenitis → matting.	3- Initial lesion occurs in the medulla → No Peradenitis → No matting
4- Caseation → cold abscess → T.B. sinus.	4- No caseation. No cold abscess.

Lymphoma تشبه

B- Microscopic picture: Stump

Multiple tubercles each consists of:

- Central zone:** Structureless eosinophilic caseous material.
- Mid zone:** Epithelioid cells and Langhan's giant cells (Peripheral multinuclei arranged in horse shoe manner).
- Peripheral zone:** Small rounded cells. (lymphocytes)

Complication:

- Cold abscess formation:**

C/P:

Soft, fluctuant swelling. The overlying skin is at first normal, and then it becomes dusky (not red or edematous as in an ordinary pyogenic abscess). A cold abscess is slightly warm and slightly tender. The skin then thins out before rupture, which ends in a sinus.

abscess Cold → warm (cold abscess)
Abscess → no pus
بالسبب
Pyogenic



(H) تباعث L.N

non Significant

Significant

Chronic non specific

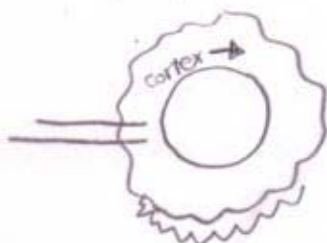
Slightly enlarged $< 1\text{cm}$

firm

discrete

Slightly tender - not tender

born
Lymph node



- periadenitis

- matting

- 1ry

- Children

- Localized

- more common

- Caseation

Blood born



- No periadenitis

- No matting

- 2ry

- Young adults

- Generalized

- less common

- No caseation

multinucleated ← ؟؟ Giant cells شقوي يكتا ايه

small giant cells شقوي يكتا ايه

؟؟ Giant cells زه ايه اى

• Langhan's giant cells (hoarse shoe)

• Reed Sturnberg cell

• Giant cells of osteoclastoma

• Giant cells of granuloma

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The cold abscess is actually "**not cold and not an abscess**". It is not cold because clinically it is warm, but is in fact colder than a pyogenic abscess. It is not an abscess because the contents are not pus but caseating material.

- 2) **Collar and stud abscess (bilocular abscess).**
- 3) **T.B. sinus.**
- 4) **Secondary infection.**
- 5) **Spread to other groups of L.N.s or miliary T.B.**
- 6) **Calcification.**

Clinical picture:

1- Lymph born (fibrocaseous) type	2- Blood born (lymphadenoid) type
1- <u>Common</u> .	1- <u>Rare</u> .
2- Usually in <u>children</u> .	2- Usually in <u>old</u> .
3- <u>Local</u> : a- <u>Localized lymphadenopathy</u> affecting the <u>upper deep cervical L.N.s</u> b- <u>Variable consistency</u> : • Early → <u>firm</u>. • Caseation → <u>cystic</u>. • Calcification → <u>hard</u>.  c- L.N.s are matted together. L.N.s may be arranged in beaded cords due to thickening of connecting lymphatics.	3- <u>Local</u> : a- <u>Generalized lymphadenopathy</u> . b- <u>Firm</u> in consistency. c- L.N.s are discrete. As the patient is usually an adult of fair resistance, there is no breaking down, caseation or cold abscess formation.

Investigations:

A) Laboratory:

- 1- CBC, ESR.
- 2- Tuberculin test serves as a good negative test.
- 3- Aspiration of a cold abscess, and examination of the aspirate microscopically and guinea pig inoculation.
- 4- Smears from a sinus and examination for tuberculous organisms.

B) Radiological:

X-ray to the chest and mediastinum.

C) Surgical:

Biopsy from the nodes will establish the diagnosis.

Treatment:

1) Tuberculous lymphadenitis before caseation:

- a. Antituberculous treatment.
- b. Surgical excision is indicated for a single group of lymph nodes showing no response to medical treatment after a period of 6 months.

ESR ← Screening test Lymphadenopathy
 ↳ marked ↑
 ↳ malignancies
 ↳ autoimmune
 ↳ T.B

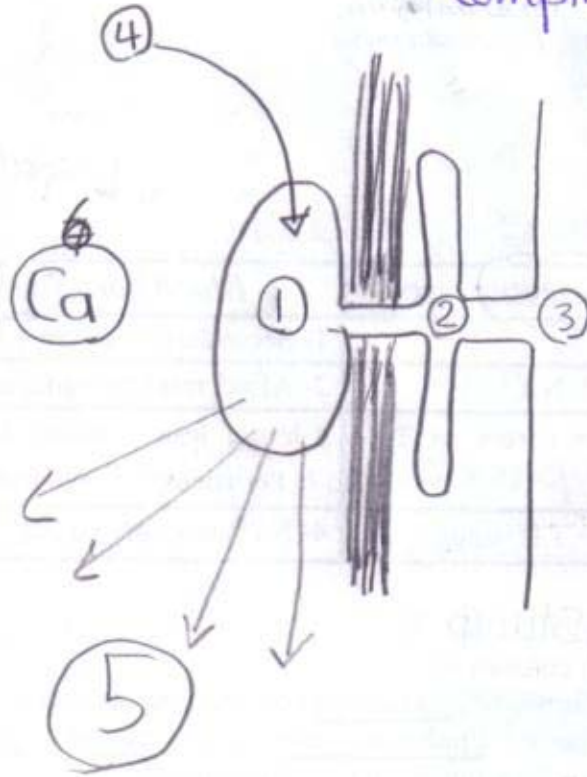
Corner Stone to diagnose

definitive diagnosis لا T.B اوى تعالج

ا. سطرين اولاتة
 ب. ٦ شين
 medical
 ٦ شين

- أماكن TB ١٩ دول يس ←
- 1- Lung
 - 2- Intestine
 - 3- Tonsils
 - 4- Skin
- ١٩ focus LN.

Complications of T.B. Lymphadenitis



Antibacterial

- Anti T.B

قانون : اوى تقول

الا وتكتب مكاها سطرين او ثلاثة عن الباطنة

2) Cold abscess:

- Antituberculous drugs.
- Aspiration and injection of streptomycin solution.

The rules of aspiration of a cold abscess should be followed to avoid sinus formation

- Wide bored needle. *لو استخدمت واحدة رفيعة مش هتعمل*
- The needle is inserted in a healthy part of the skin away from the abscess.
- The site of puncture should be in a non-dependent part.
- The needle should also pass in a **Valvular manner**

(The points of entry through the skin and the abscess cavity should not be opposite to each other).

Aspiration
The aspiration usually needs repetition every few days until the abscess dries up.

- Aspiration as complete as possible
- Injection of streptomycin

Incision: Indicated in the following conditions:

- Secondary infection.
- If the abscess is imminent to rupture.

3) Treatment of a tuberculous sinus:

- Antituberculous treatment.
- Dressing with streptomycin.
- Excision with the underlying nodes, if resistant to conservative measures.

Syphilitic Lymphadenitis

Primary stage: Localized

The draining lymph nodes of the primary chancre are usually enlarged, rubbery, discrete, do not break down. Not painful or tender.

Secondary stage: Generalized + Rash

- Generalized lymphadenopathy.
- L.N.s are discrete, not tender and rubbery.
- The characteristic sites are epitrochlear region and along the border of the sternomastoid.

Tertiary Stage: Very rare

There is no gumma of a lymph node (or is at least extremely rare).

Lymphomas

Definition:

Malignant neoplasm that arises in lymph nodes or extra nodal lymphoid tissue.

The main types are:

- Hodgkin's disease
- Non-Hodgkin's lymphoma.
- Burkitt's lymphoma.

lymphatic tissue
في كل حبة في جميعا جايها
brain
Orbit

Any Abscess → Incision & Drainage

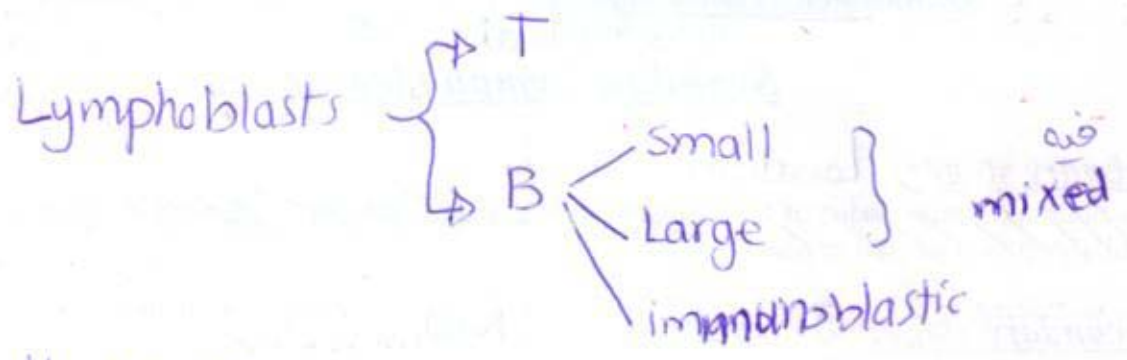
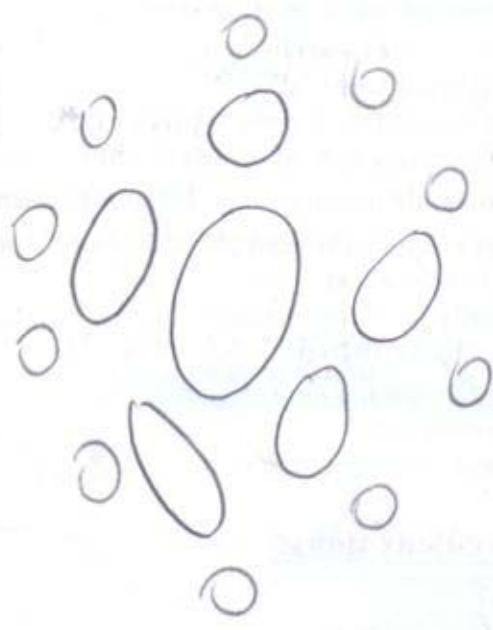
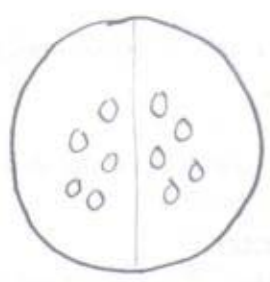
except →
→ Amebic
→ Brain
→ Cold Abscess

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I- Hodgkin's disease	II-Non Hodgkin's lymphoma
More common	Less common
Pathology: Macroscopically: - It usually starts in the cervical lymph nodes. - The affected nodes are <u>enlarged</u> <u>discrete</u>, <u>rubbery</u> & have a <u>pink</u> color. - Usually there is a large lymph node in the center with smaller lymph nodes around it. - There may be extra nodal affection of the spleen, liver or bone marrow. Microscopically: <u>Pleomorphism</u>. - The characteristic <u>Reed Sternberg cells</u>. These are giant cells that have an even number of nuclei (2 or 4), which are arranged in a mirror image manner.	Macroscopically: Lymph Nodes: 1) Markedly enlarged, amalgamated. 2) Early invasion of the surrounding structures. 3) Variable consistency but usually hard.
Classification Histological types: (In descending order of prognosis): 1) Lymphocyte predominance. 2) Nodular sclerosis. (The commonest variety). 3) Mixed cellularity. 4) Lymphocyte depletion.	Based on the cell of origin: 1) <u>B Cell lymphoma</u> is further classified into: a. Small cell lymphoma. b. Large cell lymphoma. c. Mixed small and larger cell lymphoma. d. Immunoplastic lymphoma. 2) <u>T cell lymphoma</u>. 3) <u>Lymphoblastic lymphoma</u>. 4) <u>Histiocytic lymphoma</u>. In each type the cells may be arranged in a nodular or a diffuse pattern.
Staging: Ann Arbor staging system: Stage I: Single involved lymph node group (I), or a single <u>extra nodal</u> extra lymphatic site (I^E) Stage II: Two or more involved lymph node groups limited to one side of the diaphragm or a solitary <u>extra lymphatic</u> site and one or more lymph node areas on the same side of the diaphragm (II^E). Stage III: Involvement of both sides of the diaphragm. Stage IV: <u>Systemic dissemination</u> Extra lymphatic spread including liver, lung, bone marrow, skin and gut All stages are subdivided into either: A No systemic symptoms. B One or more of the three systemic symptoms: fever, night sweats, and weight loss of more than 10% in six months.	Staging: Ann Arbor staging system: Stage I: Single involved lymph node group (I), or a single <u>extra nodal</u> extra lymphatic site (I^E) Stage II: Two or more involved lymph node groups limited to one side of the diaphragm or a solitary <u>extra lymphatic</u> site and one or more lymph node areas on the same side of the diaphragm (II^E). Stage III: Involvement of both sides of the diaphragm. Stage IV: <u>Systemic dissemination</u> Extra lymphatic spread including liver, lung, bone marrow, skin and gut All stages are subdivided into either: A No systemic symptoms. B One or more of the three systemic symptoms: fever, night sweats, and weight loss of more than 10% in six months.

Some surgeons added (S) in case of Splenic involvement

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Histocytes

Clinical Picture

• **Incidence:**

Race: More in Caucasians.

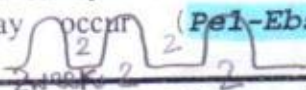
Age: Two age peaks, between 15 to 35 years, and above 50 years.

- **Painless progressive enlargement** of the cervical lymph nodes

- With progress of the disease other lymph node groups are affected. These nodes are **enlarged, discrete, non-tender, and rubbery in consistency.**

- **Splenomegaly** and **hepatomegaly** may also be present

- Some patients exhibit **systemic manifestations** in the form of **fever, night sweats, weight loss, pruritis, anemia, and jaundice.** Sometimes a **characteristic intermittent fever**, which lasts for 2 – 3 weeks followed by a remission for few weeks, may occur (**Pel-Ebstein fever**).



- **Incidence:** More common with the following conditions:

- 1) Sjogren's disease.
- 2) Immune deficiency.
- 3) Systemic lupus erythematosus.

- **Lymph node enlargement:** Progression of lymph node enlargement does not follow an orderly anatomical pattern as in Hodgkin's disease.

NHL is more likely extra nodal than Hodgkin's lymphoma e.g.:

- a- **Gastric lymphoma** produces manifestations that are similar to carcinoma.
- b- **Intestinal lymphomas** may produce intestinal obstruction, bleeding, or perforation.

- **The disease is likely to be disseminated at the time of presentation.**

Relapsing fever لا تخف من

Investigations:I- **Laboratory:**

- 1- **Blood picture:** May show: Anemia, eosinophilia or lymphopenia.
- 2- **High ESR.**
- 3- **Alkaline phosphatase** is elevated in cases with bone or liver involvement.

II- **Radiological investigation:**

- 1- **Chest X-ray and CT scan** allow detection of intrathoracic disease.
- 2- **Abdominal ultrasound and CT scan** have replaced lymphangiography for detection of ~~para-aortic node deposits.~~

III- **Surgical investigation:**

- 1- **Lymph node biopsy:** The corner stone of diagnosis.
- 2- **Staging laparotomy.**

Indications: Stages I, IB, and IIA

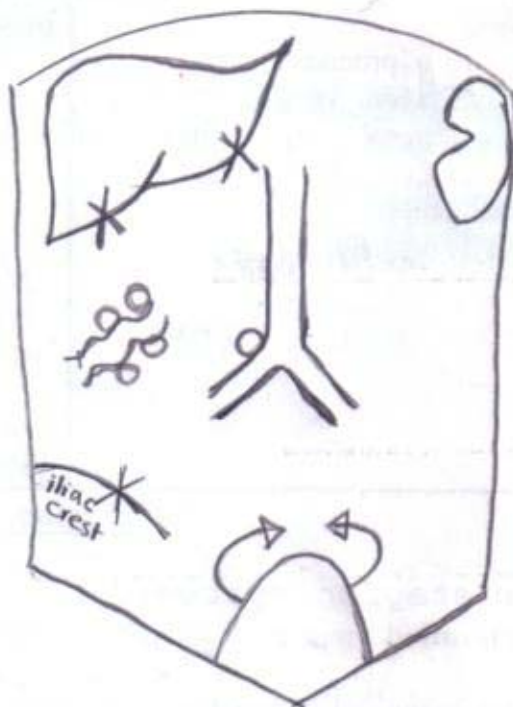
stage I, II

The operation includes:

- a- **Splenectomy:** For staging & avoids the need of its irradiation.
- b- **Biopsy of both liver lobes.**
- c- **Biopsy of all intra-abdominal lymph node groups**, which are marked by metal clips to help future localization by the radiotherapist.
- d- **Bone marrow biopsy** from the iliac crest.
- e- In females the ovaries and Fallopian tubes are fixed in the middle line behind the uterus to guard them against irradiation.

Staging laparotomy is not preferred in many centers because:

- a- The high accuracy of CT scan, and the increasing availability of MRI.
- b- The risk of overwhelming post-splenectomy infection (OPSI).



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Treatment:

- Stage **I** and **II** treated by radiotherapy.
- Stage **IIb** is treated by radiotherapy and 6 cycles of combination chemotherapy.
- Stage **III**, and **IV** are treated by 12 cycles of combination chemotherapy, **MOPP** (Mustin, Oncovin, Procarbazine and Prednisone).

Prognosis:

An average 80% 5 years survival is obtained with proper treatment

1) **Radiotherapy and combination chemotherapy** according to the stage of the disease. *may centers advise chemotherapy in all stages of non Hodgkin's*

2) **Surgery:**

- Indication: Systemic*
- 1- Gastric or intestinal lymphoma.
 - 2- Staging laparotomy.
 - 3- L N biopsy

شعوى

III- Burkitt's lymphoma

Children

Etiology:

Unknown may be related to infection with the **Ebstein Barr** (EB) virus (Malaria may have a role).

Clinical Features:

- Common below the age of 12 years, in western Africa.
- The usual presentation is **painless progressively enlarging jaw swelling**.
- It may also affect the kidneys, retroperitoneal tissues, ovaries, long bones, and central nervous system.

Treatment: Chemotherapy

Jaw Painless mass

Chemo



Burkitt's lymphoma

SECONDARY DEPOSITS

- *شعوى* The primary growth may be in a **hidden site** and may be overlooked, as in the ear, hypopharynx, nasal sinuses, nasopharynx, bronchi, stomach and testis, **thyroid** & **Colon**.
- *السطرون* The affected glands are **stony hard, painless and mobile** at first, then **become fixed and painful** and may ulcerate and fungate through the skin

محتمل نظري
Clinical

Lymphedema

Definition: Chronic edema from chronic lymphatic obstruction.

Sites: Limbs, breast, scrotum or vulva. In the limbs it affects the subcutaneous tissues.

Causes:

A) **Congenital (1st lymphedema): Rare**

- From congenital **aplasia, hypoplasia** or **varicosity** of lymphatics.
- It may be familial (**Milroy's disease**).
- It may manifest at birth (**lymphedema congenita**), at puberty (**lymphedema precox**), or in adults (**lymphedema tarda**).

↓ no of lymphatics

*لا يصبو حاد Puberty
لا يشتغل في الفيزيائية adults*

Burkitt's Lymphoma → Slide

صورة
فيديو

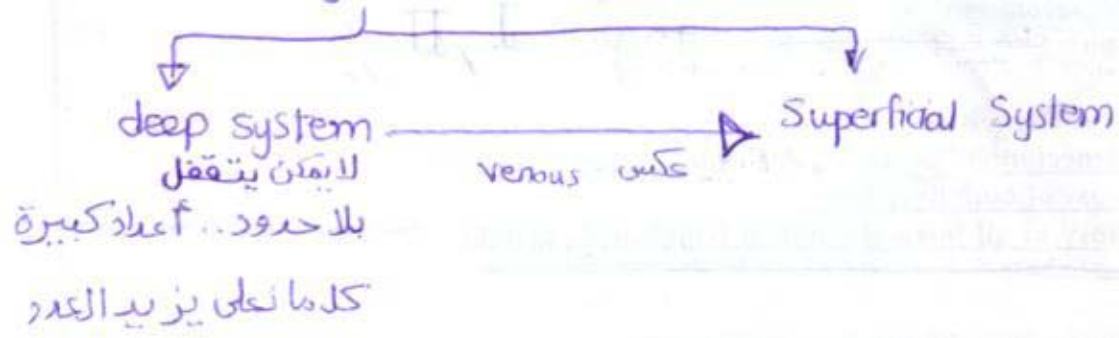
وبيضه
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painless
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western → Africa
 افريقي
↓
Africa
 عيل
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Children

Chemotherapy علاج



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Lymphatic system



Lymphatic Disorders**B) Acquired (2ry lymphedema): Common****1- Traumatic:**

- i. Circumferential skin loss. ← *عبد الحيد بطر من مصر في حزن الطقة + المظلة*
- ii. Extensive block dissection of inguinal or axillary nodes.
- iii. Surgical trauma e.g. radical mastectomy

2- Parasitic: Filariasis is the commonest cause in Egypt.**3- Inflammatory:**

- i. Chronic (recurrent acute) lymphangitis.
- ii. Chronic specific lymphangitis e.g. T.B.

4- Neoplastic:

- i. Primary affection of lymph nodes, as lymphomas.
- ii. Primary affection of lymphatics as lymphangiosarcoma
- iii. Secondary affection of lymph nodes by metastases.

Pathology:

The pathology passes into 4 stages.

- 1- **Stage of soft pitting edema** due to accumulation of large amount of protein rich fluids in the tissues.
- 2- **Stage of lymphorrhea** due to rupture of lymphatic vesicles discharging their lymph.
- 3- **Stage of fibrosis** (non-pitting edema): Extravasated fluid with its high protein content excites fibrosis of skin and subcutaneous tissues.

Lymph stasis predisposes to recurrent lymphangitis. Each attack obliterates more lymphatics, so that limb edema increases steadily.

- 4- **Stage of Elephantiasis:** The skin is roughened, pitted and non-pitting like elephant skin. *كثيره Pittings*

Lymphatic obstruction → stagnation of lymph → fibrosis → infection → more fibrosis → more obstruction...etc.

Pathological changes:**1- Swelling.****2- The skin changes:**

أكتب الدرس في ال pathology + N.B. النضال

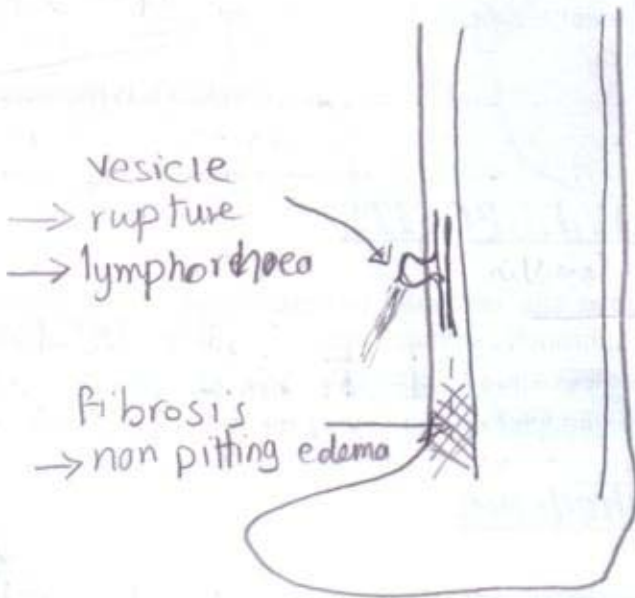
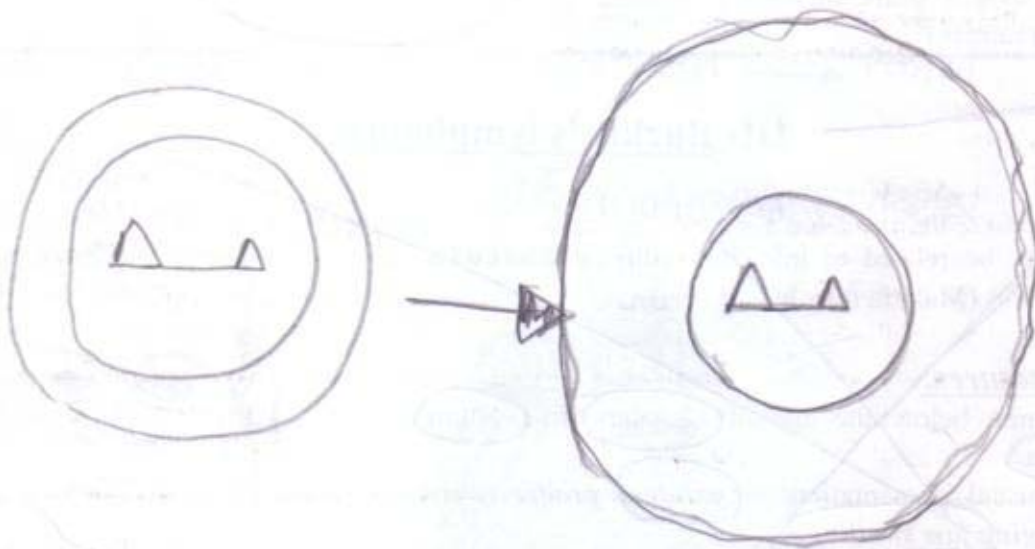
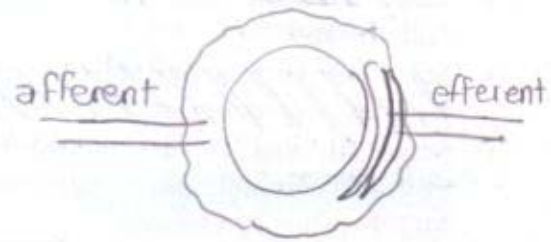
In primary lymphedema skin changes are negligible. In long standing secondary lymphedema, there is thickening and hyperkeratosis of the skin. Lymphatic vesicles may appear in the skin. It is to be noted that although the skin is very much thickened, it is not liable to ulceration as the diffusion of nutrients is normal (compare with venous ulcers in postphlebotic limbs).

Complications:

- 1- Recurrent cellulitis and lymphangitis (the most frequent). *الشعير*
- 2- Lymphedema ulcers from ruptured and infected blebs.
- 3- Huge disabling heavy limb.
- 4- Lymphangiosarcoma (very rare). *الطنير*

Differential diagnosis:

Other causes of chronic diffuse limb swelling: postphlebotic limb, elephantiasis neurofibromatosis and congenital arterio-venous fistula (local gigantism).



Lymphedema
→ ~~ly~~ elephantiasis

elephantiasis
→ lymphedema
e.g. elephantiasis neurofibromatosis

Any chronic edema by time
become non pitting



preserved ankle crease

→ Skin at ankle crease / wrist crease
is adherent to deep fascia.
→ Skin at these areas is drained
by deep lymphatics

Clinical Picture:

trauma: قابل عبد الحيد

- 1- **Type of patient:** it differs according to history of the cause e.g. in case of filarial lymphedema: adult patient from an endemic area (e.g. Giza, Imbaba, Rasheed, Damietta, Sharkaya and Assyot) complaining of **progressive leg swelling with exacerbations and partial remission.**
- 2- **During exacerbations:** (Attacks of streptococcal lymphangitis) the limb shows **red tender streaks traveling to draining L.N.s.**
- 3- The swelling is **hard non-pitting with a crease in front of the ankle.**
- 4- **In late cases:**
 - a. The skin may show **blebs**, which may **rupture** → **superficial ulcers oozing lymph (lymphorrhea).**
 - b. The skin is **dark, thick with multiple deep furrows, thick callosities and warty overgrowths (Elephantiasis).**
- 5- The **inguinal L.N.s** may be **enlarged, firm and tender** (chronic septic lymphadenitis) or may form a **soft lobulated mass** (varicose L.N.s).
- 6- **Other filarial manifestations** as **lymphedema of scrotum, filarial funiculo-epididymitis, chylocele (rupture of lymphatics in tunica vaginalis), chylous ascitis and chylothorax.**

Investigation:

- 1- **Night blood film** between 10pm - 2am- may show microfilaria in active filariasis.
- 2- **Blood picture:** Shows **esinophilia.**
- 3- **Intra dermal tests.**
- 4- **Inguinal L.N. Biopsy:** May show **dead filaria worms, calcification or malignant infiltration** in case of malignant deposits.
- 5- **Lymphangiography**
- 6- **Lymphoscintigraphy by using technetium 99^m.**

نطح على colloidal ← HMW ← حقه في ال Web ← يخنس Lymphatics

Treatment:1- **Conservative treatment:****Indication:** Mild and moderate cases.**Method:**

- Limb hygiene, elevation, elastic stockings and diuretics.
- Long acting penicillin 1,200,000 units every 3 weeks.
- Active filarial infection is treated by diethyl carbamazine.

recurrent attack of streptococcal infection علسان اوقف

Dose: 1mg/kg increased over 3 days to 6mg/kg/day for 21 days.

لما ال ديانة تقرصه منتقلش عدوى → نفوت microfilaria → للإشابة إوى تقول للعيان إنها للإشابة

2- **Surgical Treatment:****Physiological Operations:**

- 1) **Enteromesenteric bridge operation.** A segment of the ileum with its mesentery is separated and is brought under the inguinal ligament. The mucosa of the bowel is removed and the opened bowel is sutured over the cut lymph nodes.
- 2) **Omental flap operation.** A segment of the greater omentum is mobilized with intact blood supply and is transferred into the lower limb to increase the lymphatic drainage.
- 3) **Microlymphatico-venous anastomosis.** The dilated obstructed lymphatic trunks are anastomosed to nearby veins.
- 4) **Microlymphatic transfer operation:** healthy lymphatic trunks are harvested from the normal limb & anastomosed to bypass the obstructed lymphatics.
- 5) **Lympho-venous anastomosis.** A lymph node is bisected and anastomosed to a nearby vein.

علاوين غير مقبولة

Post Phlebitic limb	Lymphoedema
painful	painless
Skin pigmentation & ulceration	recurrent streptococcal infections (cellulitis)
History DVT	No history DVT endemic areas
ankle crease ^{not} preserved	not preserved
pitting	non pitting

* Lymphangiography

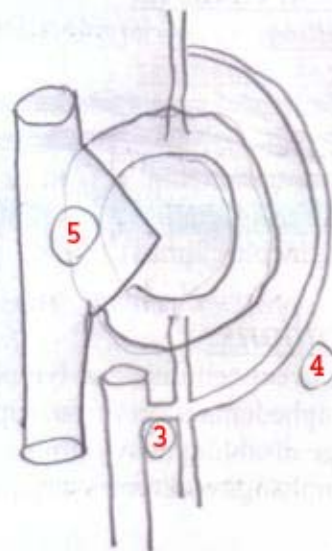
- inject 1cm patent blue in 1st web on dorsum of foot.
- Open surgically on coloured lymphatic & introduce your cannula

HMW → lymphatics مباحثه فوش غير

* Lymphoscintigraphy

using radioisotope

lymphatics بخش ← web ← اقصا فال (HMW) Colloid اصبغة



3: microlymphatico venous anastomosis

4: Microlymphatic transfer operation

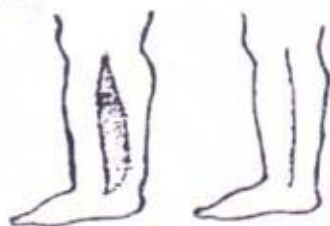
5: Lymphovenous anastomosis.

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Excisional operations:

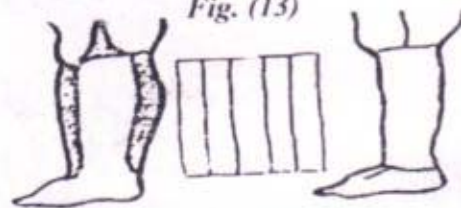
- 1) **Charles operation** entails excision of the skin and subcutaneous tissues and covering the limb by split skin graft.

Fig. (12)



Sistrunk Operation

Fig. (13)



Charles's Operation

- 2) **Sistrunk operation** includes excision of an ellipse of skin and subcutaneous tissues and closure of the defect. This decreases the bulk of the limb at one side. This can be repeated on the other side at later date.

Physiological and excisional operations:Thompson operation (Swiss roll operation)

obsolete

Thompson's operation consists essentially of excision of subcutaneous tissue and then implantation of a shaved flap of skin between the muscles near the deep lymphatic vessels so that the physiological drainage may be improved.

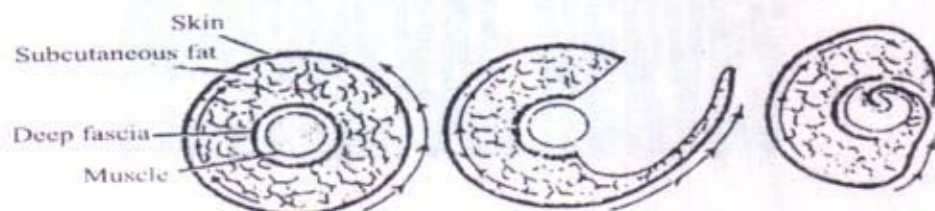


Fig. (14)

Thompson's Operation

Filarial Lymphedema

- This is the **commonest cause of lymphedema in tropics**.
- It occurs where **culex pipiens mosquito** (intermediate host) exists.
- Very heavy and repeated infestation** by mosquito bites is essential for pathology to start.

Cause: Wuchereria Baneroffi.

Life cycle: In man (**definitive host**) the mature worms live in the lymphatics and lymph nodes. The microfilaria are laid by the female, and then circulate in the peripheral blood at night. They have a **nocturnal periodicity** (between 10 pm. - 2 am. with the peak round midnight). The microfilaria are sucked by the mosquito **culex pipiens** (**intermediate host**). In the body of mosquito, the microfilaria passes to stage of **embryofilaria** (**infective stage**) where it is injected into the body of patient by bite of mosquito. The embryofilaria mature to adult worms.

Pathology:

Adult worms live in the **cortex of lymph nodes** obstructing the outflow of lymph. This produces **cystic enlargement** of lymph node, which is given the name of **varicose gland**.

Role of filaria worms is Just to start attacks of streptococcal lymphangitis by causing lymph stasis. Big number of worms is essential. Once lymphangitis starts, the disease continues automatically like any lymphedema, whether worms are living or dead.



Physiological:

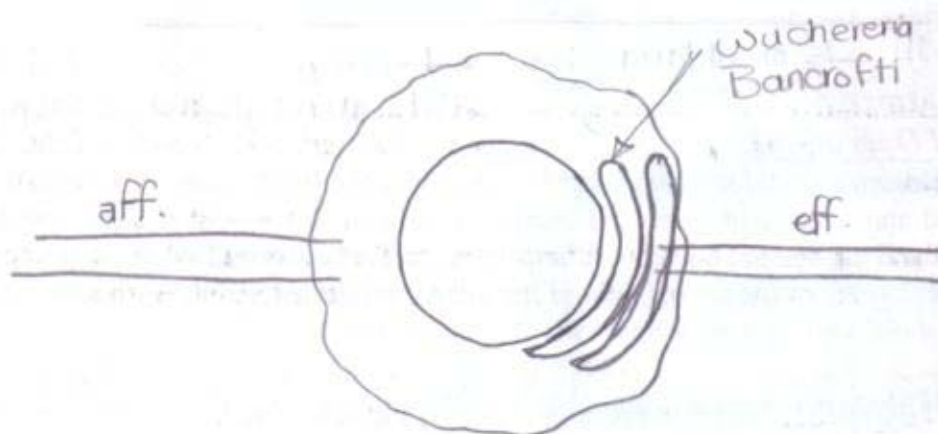
thick { Skin } ساق
 { S.C }

Excisional:

obstruction ساق

cover try شال کتا و ساق

Flap شال کتا و ساق



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Peripheral Nerves

Nerve Injuries

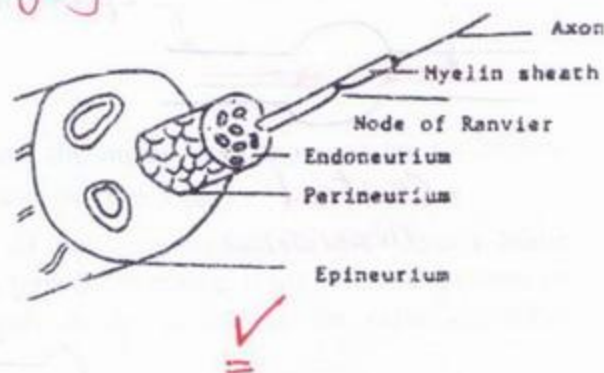
محتل نظري
مهم جداً على

X Causes of nerve injury:

→ Open or closed injury.

Fig. (15)

- 1- **Open injuries:** As a result of stabs, bullets and lacerated wounds or deep burns.
- 2- **Closed injuries:** As in fractures and dislocations: It may be due to:
 - a. Compression from outside as by tourniquet, plaster of paris, edge of operating table (as in radial nerve injury).
 - b. Traction Injuries as birth injury.
 - c. Ischemic injuries.
 - d. Contusion by a direct blow.
 - e. Chemical irritation as by accidental injection of irritant drugs in a nerve.



Pathology:

- 1- **Neuropraxia:** (concussion of nerves). There is momentary loss of conduction through the nerve without any organic lesion (nerve fibers are intact). No degeneration. Recovery is complete and quick.
praxia = function
- 2- **Axontmesis:** This injury involves the axon without loss of continuity of nerve sheath. *= cutting* **Wallerian degeneration** occurs. There is complete motor and sensory paralysis. Recovery is usually complete as the sheaths are intact.
- 3- **Neurotmesis:** Partial or complete division of a nerve. Degeneration occurs with the formation of terminal or lateral neuroma. Spontaneous recovery is impossible, recovery only after treatment and usually incomplete (due to maldistribution of fibers).

Effects of total division of a mixed nerve: عارون

1- Motor effects:

- a. Loss of voluntary contraction.
- b. Muscle atrophy and wasting.
- c. Deformity ~~due to stretching~~ of the paralyzed muscle by the unparalyzed opponent (e.g. Claw hand).
- d. ~~Loss of reflexes.~~

2- Sensory changes:

- a. Anesthesia in the area supplied by the nerve (usually less than the anatomical distribution due to overlap of dermatomes).
- b. Pain referred along the distribution of the injured nerve.

3- Vasomotor changes:

- a. Primary vasodilatation due to paralysis of vasomotor fibers.
- b. Later there is vasoconstriction from loss of the afferent part of vasomotor reflex.

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Nerve injuries:-

very very very imp **Clinical** $\leftarrow$ Long Short

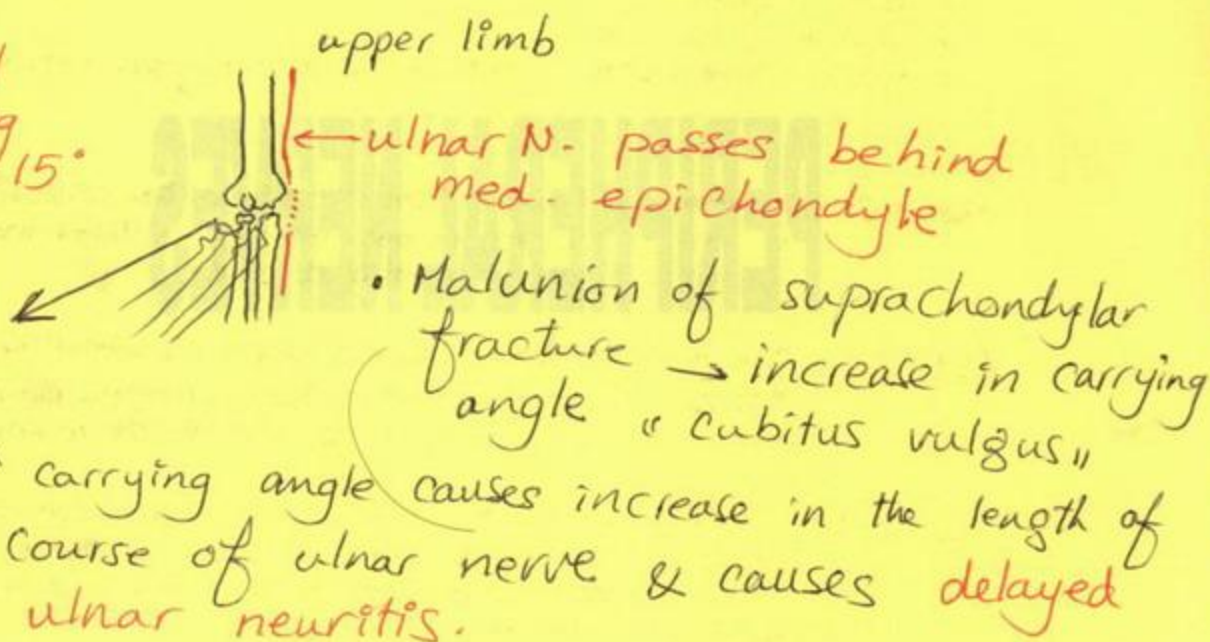
Aetiology of N. injury:

1. Open

2. Closed

NB. $\rightarrow$ carpal tunnel syndrome.

Normal carrying angle $\approx 15^\circ$



Cubitus valgus $\rightarrow$ causes delayed ulnar neuritis ($\uparrow$ carrying angle)

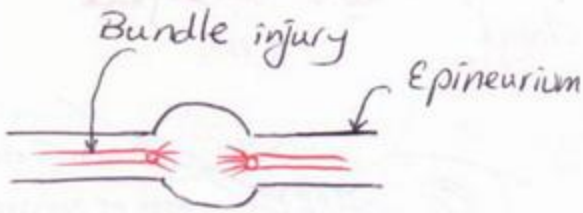
$\rightarrow$ **##** by anterior transposition of ulnar nerve.

• The most common cause of cubitus valgus is malunion of supracondylar fracture.

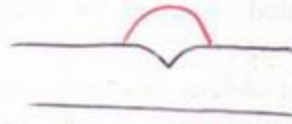
Example: How to calculate expected time of regeneration in axonotmesis:-

- One week lag.
- 1-3 mm/day.

• Neuroma formation:-



• Central neuroma.



• Lateral neuroma



• Terminal neuroma.

• No nerve repair after one year of injury
أكبر ما ينفعش

Quinizarine powder:-

بودرة زرقاء وتتحول للون الاحمر لما
يجي عليها ماء (sweating)

4- **Pseudomotor:** Loss of sweating = Anhydrosis.

5- **Trophic changes:**

- Skin becomes thin and shiny with loss of subcutaneous fat.
- Nails become distorted and brittle.
- Bone becomes decalcified.

6- **Changes in the nerve:**

- Retraction of divided ends.
- Wallerian degeneration** occurs below the injury, and above as far as the first **node of Ranvier**. Degeneration starts 4 days after injury.
- Neuroma formation:** It is formed of the growing axons and fibrous tissue reaction, which give a swelling wrongly termed neuroma. It may be in the center of the nerve (central), on one side (lateral) or at the end of the nerve (terminal neuroma).

Diagnosis of nerve injury:

1- **Clinical picture:** History of trauma and its type. Examination for the effects (see before).

2- **Tests:**

- Sweating test** to map out the area of anhydrosis using **Quinizarine powder**.
- X-ray** for detection of foreign bodies and fractures.
- Nerve conduction velocity (NCV):** Neuropraxia does not interfere with NCV. However, after complete transection of a nerve, NCV progressively decreases. With regeneration NCV will gradually increase.
- Electromyography:** Two to four weeks after complete nerve injury, the denervated muscle shows spontaneous fibrillations (**fibrillation p pattern**). These fibrillations remain as long as the muscle is still viable, but if complete fibrosis occurs, no electrical activity is detected and the muscle is no longer suitable for reinnervation.

Treatment:

1- **Conservative treatment:**

It is indicated in closed injuries: in neuropraxia and axontmesis and during nerve repair until reinnervation occurs. **This consists of:**

- Splintage:** To prevent over stretching of the paralyzed muscles.
- Galvanic stimulation** to prevent atrophy and wasting of paralyzed muscles.
- Physiotherapy.**

2- **Operative treatment:**

It is indicated in open injuries and in closed injuries, which fail to recover within the expected time of recovery. **This consists of:**

A- **Nerve repair:**

- In clean incised wounds** immediate primary suture is the ideal treatment as it gives the best results.
- In contaminated or lacerated wounds:** Primary nerve suture should not be attempted.

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- **Ulnar & Median:-**
Mixed & responsible for fine movement.
So, results of repair are less than radial.
- **Radial:-** purely motor.
- **Level of suture:-**
wrist is better than elbow
"less time needed for regeneration"
- **Extent of injury:-**
whether the nerve is only injured
- Or other structures as bone, vessels
"better results if nerve alone)

- Secondary nerve suture is performed after complete healing of the skin 2-3 weeks as:
 - 1) ~~Dissection opens new planes for infection.~~
 - 2) ~~The nerve sheath is too thin to hold sutures, after 2-3 weeks the nerve sheath is toughened.~~

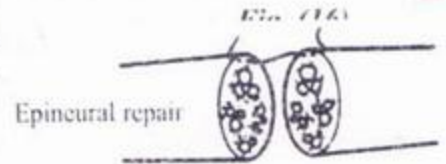
نقرتهم بس
بغزة لتجنب
Retraction ال

- The ends of the divided nerve are loosely approximated with single stitch of silk.

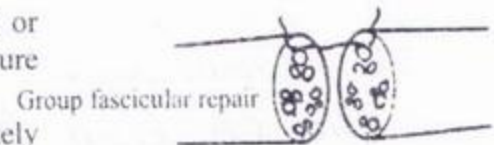
• Non absorbable
• Black in color (easy to find)

Technique:

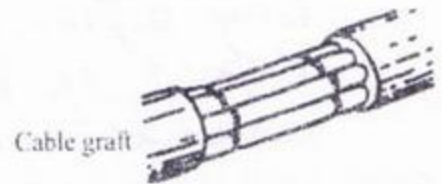
- 1) If the nerve is constricted between fragments or in scar tissue, it is mobilized to relieve any pressure or constriction (*neurolysis*).



- 2) If the nerve is obviously completely divided or the seat of a firm bulbous neuroma, nerve suture is indicated:



The nerve trunk is clearly divided immediately above and below the damaged area. Accurate apposition is obtained by interrupted 6/0 prolene sutures. The sutures pick up the nerve sheath only (epineurium). This type of repair is called "*epineural repair*". A more accurate repair called "*interfascicular repair*" is performed using the operating microscope where the fasciculi of the proximal and distal segments are very accurately opposed by passing the sutures through the perineurium.



Post-operative care:

- 1) Plaster fixation is maintained for 3 weeks.
- 2) Care of the denervated structures continues until recovery of function.
- 3) Rehabilitation.

as conservative ← splintage.
Galvanic.
Physio

Results:

The prospects of success depend on several factors:

- 1) The injured nerve. The radial nerve is the most satisfactory.
- 2) Level of suture.
- 3) Time interval between injury and suture.
- 4) Extent of injury.
- 5) Age and general condition of the patient. The results of nerve suture are particularly good in children and adolescents.

(Mainly Motor, responsible for coarse movement)

- Only if the approximation of the two ends is difficult, one of the following methods is done:

- 1) Flexion of the limb.
- 2) Mobilization of the nerve proximally and distally → اسلكه
- 3) Stripping of unimportant anchoring branches.
- 4) Transposition of the nerve to shorten its course.
- 5) Bone shortening.

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• Nerve graft:-

from the sural nerve (the commonest graft) which is a branch from the medial popliteal nerve & accompany short saphenous vein

(مأخوذ من العصب الـ leg و يصير واد الـ)
(lateral malleolus)

• Saphenous:- جاذبة من كلمة (صافي) يعني سهل يتساقط

• Saphenous nerve:

Branch from femoral nerve & accompany long saphenous vein (along medial aspect of thigh & leg & anterior to medial malleolus).

• Tendon transplantation:-

نوع tendon يتابع عضية شغالة لكان الـ insertion يتابع عضية من شغالة .

• If there is injury of ulnar & median nerves:-

سؤال: مايزي نأخذ graft من واد الـ الثاني ؟
نأخذ من العضو ؟؟

• Take the graft from ulnar nerve (as it is less important than median)

Nerve

- 6) Nerve grafting either by using a less important nerve or multiple strands of cutaneous nerve are used as a bundle (*Cable graft*).

مهم جدا
كل حالات الاعصاب تحتاج هذا العلاج
B- Orthopedic treatment:

Is used when one fails to make the nerve to recover. It consists of:

- 1) **Arthrodesis:** Fixation of the joint.
- 2) **Tendon transplantation.**

✕ Brachial Plexus ✕

Etiology:

- 1- Open injuries.
- 2- Traction injuries.
- 3- Pressure injuries e.g. Fractures of the clavicle.

Clinical Features:

Three types of lesions are present:

- 1- **Whole plexus type:** rare.
 - The whole arm is paralyzed, flaccid & anesthetic by the patient's side.
 - Sensation is present only on the medial side of the arm (intercosto-brachial nerve).
 - There may be sympathetic paralysis of the eye and face producing ptosis, myosis, enophthalmos and anhydrosis of one side of the face (Horner's syndrome).
- 2- **Upper arm type (Erb-Duchenne paralysis)** The 5th & sometimes 6th cervical nerves are involved:
 - a. The limb hangs by the side with the forearm extended and pronated in the so-called "policeman tip" position.
 - b. The arm can't be abducted or rotated, the elbow cannot be flexed & the forearm can't be supinated.
 - c. The movements of the hand and wrist are not impaired.
 - d. Sensory changes are absent if the fifth nerve only is involved, but if the sixth nerve also suffers, an area of anesthesia is present over the outer side of the arm.
- 3- **Lower arm type (Klumpke's paralysis):** The 1st thoracic & sometimes the 8th cervical nerves are affected:
 - a. Paralysis of the intrinsic muscles of the hand (1st thoracic).
 - b. Claw hand with wasting of small muscles of the hand.
 - c. Anesthesia along the inner side of the forearm and inner 3 & 1/2 fingers.
 - d. Horner's syndrome may occur.

Treatment:

- Conservative treatment.
- Exploration of the plexus is indicated in lesions which fail to show any evidence of recovery within 2 months.

Circumflex nerve injury

Causes:

Gunshot wounds, direct blow, fractures of surgical neck of humerus or crutch palsy.

Clinically:

Deltoid and teres minor are paralyzed leading to loss of abduction of shoulder (between 15- 90), and shoulder is flat (due to wasting of deltoid).

Radial nerve injury

Etiology:

- 1- Injury in the axilla may result from pressure by crutches or may follow fractures and dislocations of the upper end of the humerus or attempts at their reduction.
- 2- Injury in the spiral groove may be due to:
 - a. Fractures of the shaft of the humerus.
 - b. The edge of a chair in Saturday-night paralysis.
 - c. Prolonged application of a tourniquet.
 - d. Operation in which the outstretched arm has rested on the edge of the table.
 - e. Intramuscular injections of irritant drugs.
- 3- Posterior interosseus nerve may be injured in fracture head of radius.

Clinical picture:

• Injury in the axilla:

1- Motor paralysis:

- a. Paralysis of triceps (uncommon) **leading to** flexion of elbow (extended only by weight of forearm).
- b. Paralysis of supinator and brachioradialis. **As a result** the forearm is pronated (biceps can act as supinator on flexion of elbow).
- c. Paralysis of extensors of wrist **leading to wrist drop** and paralysis of extensors of the fingers leading to **finger drop** with flexion at metacarpophalangeal joint. As the lumbricals and interossei are not paralyzed, extension of the terminal 2 phalanges can be done.

• Injury in the spiral groove:

- 1- Motor paralysis is similar to those following injury in the axilla except that the triceps and anconeus muscles escape.

- 2- Sensory loss: Anesthesia is limited to a patch on dorsum of the hand and thumb.

• Injury in the elbow:

- 1- Motor paralysis: Posterior interosseus nerve injury. The elbow can be extended and supination is free. Finger drop is present; the wrist can be extended by Extensor carpi radialis longus.

- 2- Sensory loss: Small area on radial side of the back of hand and thumb.

N.B: The grasp is weak since the flexion cannot be tightened by extending the wrist joint.

Treatment:

- 1- **Conservative:** Keep the wrist and fingers in extension on a "cockup" splint, Massage, electric stimulation.
- 2- **Surgical:** If no improvement occurs in 1.5 months. Secondary nerve suture is done. If there is loss of nerve substance, the radial nerve is transposed to the front of humerus. (*Good results are obtained, as the nerve is almost purely motor*).
- 3- **Tendon transplantation:** If nerve suture fails. Grafting the tendon of flexor carpi ulnaris to extensors of the fingers and flexor carpi radialis to extensors of thumb.

✕ Median nerve injury ✕

Causes:

Cut wounds above the wrist, fractures of lower end of radius and dislocation of lunate bone.

Clinical picture:**1- Injury above the wrist:**

- a. **Motor paralysis:** Paralysis of all muscles of thumb except adductor pollicis (which is supplied by the ulnar nerve). The thenar eminence is flattened; the thumb is adducted like the thumb of apes (*Ape hand*). The thumb can't be abducted or opposed.
- b. **Sensory loss:** Over the lateral 3 & 1/2 fingers and lateral 3/5 of the palm.
- c. **Trophic changes:** Loss of the pulp fat leading to tapering of the fingers.

2- Injury in the forearm: Same like above and in addition there is:

- a. **Motor paralysis:** Of the 2 pronators leading to loss of pronation.
- b. Loss of flexion of the distal phalanx of index finger (paralysis of profundus), loss of flexion of middle phalanx (paralysis of superficialis) and lost flexion at metacarpophalangeal joint (paralysis of 1st lumbrical muscle). Thus in **clasp test** the index is permanently extended and tapering. This is called **pointed (thin) pointing (extended) finger**.
- c. Loss of flexion of the terminal phalanx of thumb (due to paralysis of flexor pollicis longus).
- d. **Causalgia:** Severe burning pain along the distribution of median nerve injury. This pain is relieved by sympathectomy.

Prognosis:

In median nerve injury is poor as it is a mixed nerve and supplies muscles, which control the movements.

✕ Ulnar nerve injury ✕

- The nerve is either injured at the elbow or wrist

• Injury at the elbow:

- **Causes:**

- 1- Fractures of the medial epicondyle.
- 2- Excision of the elbow joint.

- 3- Cubitus valgus due to old injury of the humerus and increase of the carrying angle. The ulnar nerve is unduly stretched and continuous friction leads to interstitial neuritis.
- 4- Wounds at the elbow.

○ **Clinical picture:**

1- **Motor paralysis:**

- a. The flexor carpi ulnaris and medial 1/2 of profundus are paralyzed. This results in hyperextension at the metacarpophalangeal joint (as the flexors are weak).
- b. Paralysis of all short muscles of the hand except 1st and 2nd lumbricals, flexor, opponens and abductor of the thumb.

Froment's test: If the patient is asked to hold a piece of paper between his thumb and fingers, the terminal phalanx of thumb is flexed, as the patient is unable to adduct the thumb. Paralysis of interossei leading to wasting and inability to adduct fingers (tested by holding a paper between fingers).

- 2- **Sensory loss:** Over the medial 1 1/2 fingers and medial 1/3 of hand in front and behind.
- 3- **Trophic changes:** Marked.

• **Injury at the wrist:**

- *Causes are the same causes as those of injury of median nerve at wrist*

○ **Clinical picture:**

- 1- **Motor:** Paralysis and wasting of small muscles of the hand.
- 2- **Sensory loss:** On the anterior aspect of the inner 1 1/2 finger.
- 3- **Trophic changes** correspond to area of sensory loss.

Treatment:

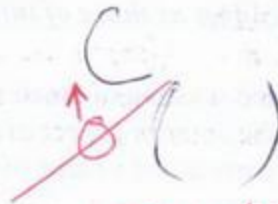
General principles are applied but prognosis is bad.

N.B.: A cut wound at the front of the wrist may injure the ulnar and median nerves, one or more of the flexor tendons in addition to the blood vessels.

Injuries of nerves of the lower limbs

	Sciatic nerve	Lateral popliteal nerve	Medial popliteal nerve
<i>Causes of injury</i>	Wounds, fractures, dislocation of hip or intramuscular injection of drugs. <i>(The nerve may be paralyzed while it is still in the pelvis by tumors or aneurysms)</i>	1- Fracture neck fibula (or its excision). 2- Pressure from plasters or splints. 3- Wounds.	
<i>Motor</i>	Paralysis of flexors of the knee <i>(but some degree of flexion can be done by sartorius and gracilis)</i> . Complete paralysis below knee.	Complete paralysis of the extensors and peroneal muscles leading to Talipes equino-varus deformity	Paralysis of muscles of the calf and sole leading to Talipes calcaneo-valgus and clawing of toes.

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acoustic neuroma.

Molluscum fibrosum



// plexiform
neuroma
(patchy dermatocele)

Nerve

Sensory	Complete sensory loss below knee with the exception of skin supplied by Saphenous nerve (<i>inner side of leg, inner border of foot and big toe</i>).	Over the dorsum of the foot and part of the front and outer side of leg.	Sensory loss over the sole.
Sympathetic	Changes on the sole and toes (<i>Causalgia: In partial nerve injury</i>)		Severe trophic changes, (<i>Causalgia in partial nerve injury</i>).
Treatment	General principles are applied.		
Prognosis		Good in early nerve suture (the nerve is mostly motor).	

Neurofibromatosis

عائود
ساقين

Definition:

It is a congenital disease affecting nerves and the resulting tumors arise from fibrous tissue of the neurilemmal sheath

Types of neurofibromatosis:

1- Generalized type: (*Von Recklinghausen's disease*).

- It may affect any nerve trunk (*cranial or spinal*). Multiple tumors all over the body occur. Each tumor is painless but tender (*due to pressure on, and not infiltration of, the affected nerve*)
- The swelling is fusiform in shape; firm in consistency, mobile across but not a long the nerve trunk. عقدة في حبل
- No interference with nerve function i.e. no spontaneous pain, anesthesia or paralysis of motor nerves. (*Any interference with nerve function means sarcomatous transformation*). Brownish pigmentation of the skin is associated "*Café au lait*" patches
- **Treatment:** Removal only of tumors causing pain or pressure effect. "as in sole of foot"

2- Solitary neurofibroma:

Affecting one nerve trunk (*cranial or spinal*). The swelling is firm, tender, moves across but not a long the line of the nerve. It may turn malignant and must be removed.

3- Acoustic neuroma:

- Solitary neurofibroma arising from acoustic nerve leading to deafness, cerebellar symptoms and increased intracranial tension. It may be solitary or as a part of the generalized disease.

4- Molluscum fibrosum:

- It is a neurofibroma arising from the termination of cutaneous nerves. It affects any part of the skin except the palms and soles.

5- **Plexiform neuroma:**

It affects subcutaneous nerve plexuses. The skin is redundant and the thickened nerves and neurofibromata are felt as multiple firm nodulated cords.

6- **Elephantiasis neuromatosa:**

Marked thickening of skin and subcutaneous tissue of a part of the body (commonly a limb).

7- **Neurofibrosarcoma:**

- May arise de-novo or on top of a neurofibroma. It is a fibrosarcoma arising from fibrous tissue of neurilemmal sheath.
- The tumor grows rapidly. Local infiltration occurs early and distant metastasis may occur.
- There is spontaneous pain, interference with nerve function (anesthesia and paralysis).
- **Treatment:** Of neurosarcoma is wide excision or amputation

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THYROID DISEASES

* Written :

كلمة

* Clinical

Short
Long

منحبهاش ومنخافش منها

* Tars :

كثير

* Operative : Thyroidectomy

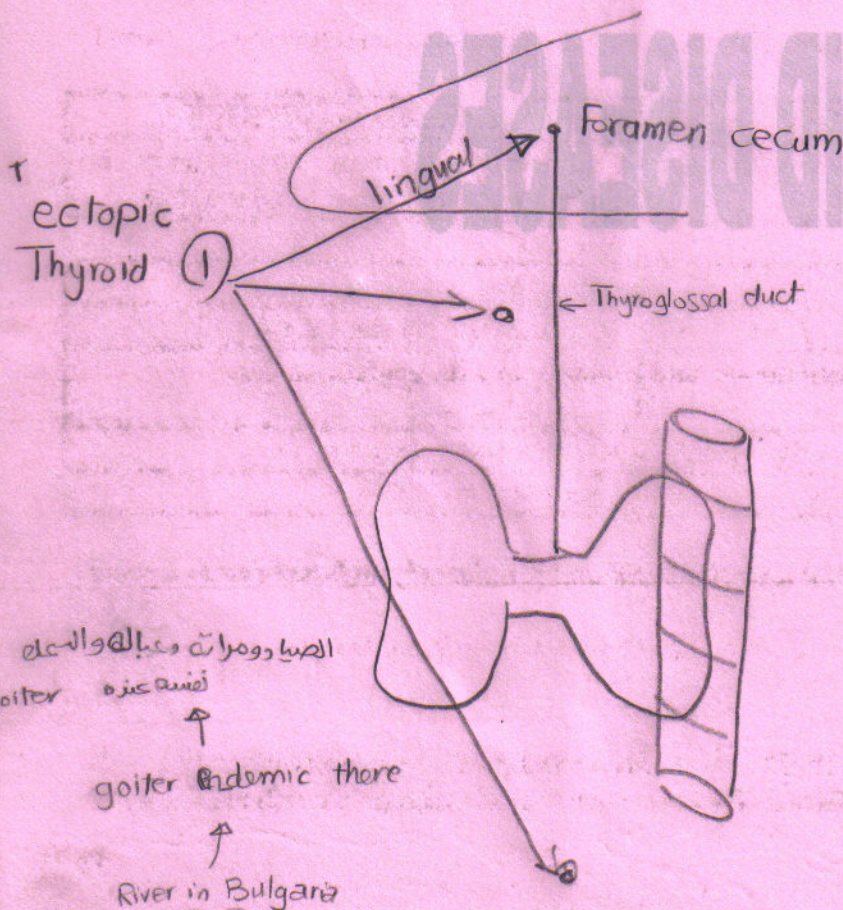
* Xray : Thyroid Scan

* Anatomy :

مهم

شفوف

فين



Sis trunk

في الجراحة

1- Thyroglossal Cyst

2- lymphedema

3- Hypospadias

(2) Struma Ovarii : ovarian teratoma

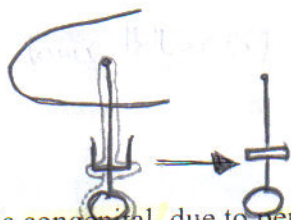
(3) Lateral Aberrant thyroid

Investigations thyroid Scan تعرفها ب

(H) surgical excision after being sure that this is the only site of ectopic thyroid

Thyroid Diseases

Thyroglossal cyst & fistula



Thyroglossal cyst

etiology
clinically
D.D
structure
treatment
مهم نظري وشفوي

Is congenital, due to persisting part of thyroglossal duct.

It is characterized clinically by:

- 1- **Age of onset:** Although congenital it is not present since birth but appears in childhood (It needs time to enlarge).
- 2- **Size:** Small (2-3 cm diameter).
- 3- **Site:** Commonly subhyoid, less commonly on thyroid cartilage and rarely suprahyoid. It lies in midline, but if on thyroid cartilage it is pushed by the central prominence of larynx to one side, usually the left.
- 4- **Mobility:** Being attached to foramen caecum, it moves up with protrusion of tongue (*diagnostic*). In addition it moves up with swallowing as goitre, being inside pretracheal fascia.
- 5- **Attached to hyoid bone by a fibrous cord.**
- 6- **Liabile to repeated infection.**

D.D.: From midline neck swellings (cystic and solid), but mainly from cystadenoma of thyroid isthmus.

	Thyroglossal cyst	Cystadenoma thyroid isthmus
1- Origin	Persistent part of thyroglossal tract, i.e. congenital	Cystic change in a nodule may be associated with diffuse nodular goitre.
2- Age	Child	Adult
3- Size	Small	Any size
4- Site	Usually infrahyoid	Opposite tracheal rings 2,3,4
5- Mobility	Moves up with deglutition and tongue protrusion.	Moves up with deglutition only
6- Attachment	Attached to hyoid bone by a fibrous cord.	Not attached to hyoid bone.
7- Infection	Very common	Less common

N.B.:

X - A cystadenoma of pyramidal lobe may lie near the hyoid and simulate thyroglossal cyst to a great extent.

- Thyroglossal cyst & subhyoid bursitis moves with deglutition & protrusion of tongue.

Structure:

The cyst is lined with columnar epithelium. Its wall is rich in lymphatic tissue communicating with cervical nodes making the cyst liable to infection. The cyst contains clear mucoid fluid rich in cholesterol crystals.

Thyroglossal fistula

⊕ Never congenital, but results from:

- 1- Incomplete removal of thyroglossal cysts.
- 2- Rupture or incision of the inflamed cyst.

Clinically:

- 1- History of pre-existing cyst.
- 2- The fistula opens in midline, low in neck.

secretion of mucous مبيضات غشائية

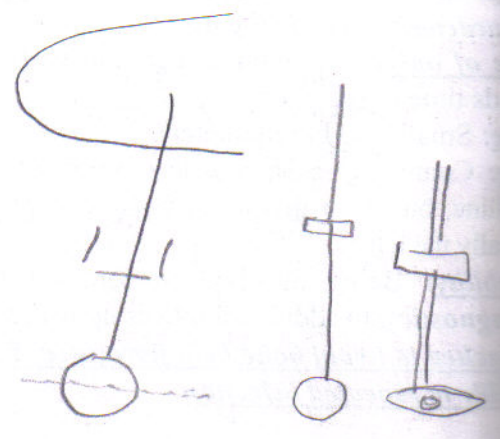
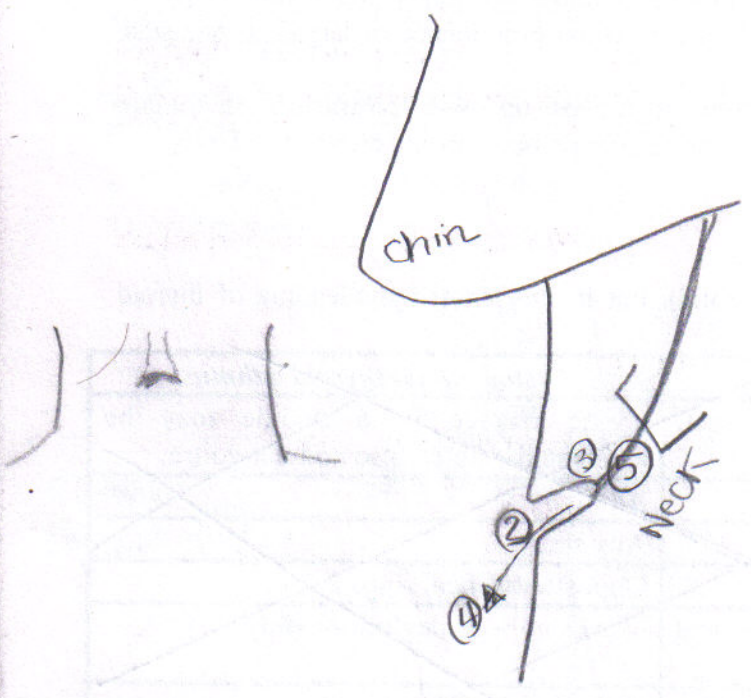
لازم تشخيص للعيان

D.D

لأى Sinus في الدنيا حاجتين (مش في الحالة دي)

1- Chronic osteomyelitis

2- T.B.



- 3- The opening shows a characteristic semilunar fold of skin due to retraction of the fistula as the neck elongates.
- 4- It discharges mucus and, if infected, pus.
- 5- The track of the fistula can be felt as cord attached to body of hyoid bone and moves up with protrusion of tongue and also with swallowing.

D.D.: From fistulae and sinuses in neck.

Structure:

The thyroglossal fistula is lined by columnar epithelium and discharges mucus. Its wall is rich in lymphoid tissue and is liable to recurrent inflammation.

Lpus

Treatment:

The same for cyst of fistula. The idea is to remove all remnants of thyroglossal duct up to foramen caecum (Sistrunk's operation) the fistula or cyst is dissected and the track is followed up to hyoid bone. The body of hyoid bone is excised with the track, being adherent to it. Finally, the track is followed up to foramen caecum in tongue.

N.B. Recurrence after operation occurs as a thyroglossal fistula. This is due to incomplete removal of thyroglossal duct.

Lingual thyroid

Pathology

Failure of descent of the thyroid can lead to an intralingual development of the gland.

Clinical picture

Patients may present with a tongue swelling with obstructive manifestations i.e. dysphagia, difficult breathing or change of quality of voice.

Investigations

Thyroid scans: show absence of thyroid tissue in the normal side in the neck.

Treatment

- ☐ Full replacement with L-thyroxine to induce reduction in size.
- ☐ Surgical excision
- ☐ Radioactive-iodine ablation

Mechanism of formation of thyroid hormones

Classic الحواز

1. Iodine trapping.
2. Oxidation by peroxidase enzyme (inorganic → organic).
3. Binding to tyrosine → Mono & di-iodotyrosine (MIT, DIT)
4. Coupling of MIT & DIT → T₃, T₄
5. Storage as thyroglobulin.
6. Release.

N.B.:

Perchlorate → prevents T
Carbimazol & Thyouracil → depress B
Lugol's iodine → depress R
T.S.H → +++ T, O, B, C, S, R & produces hyperplasia of the gland

more common in ♀ ← Thyroid diseases JS
except Anaplastic Carcinoma



moderate iodine or enzymatic deficiency → Simple goiter
Severe " " " " → Hypothyroid goiter

N.B.: The Pituitary – Thyroid Axis:

T.S.H secretion is controlled by blood level of thyroxin. A low blood level of thyroxin stimulates the release of T.R.H (thyrotropin releasing hormone), which stimulates the anterior pituitary to produce T.S.H. The later increases the size of the thyroid gland, its vascularity and its production of thyroid hormones.

A high level of thyroxin on the other hand inhibits TRH & T.S.H and reduces the release of thyroxin.

Goitre**What is goitre?**

It is any enlargement of thyroid gland.

Non neoplastic non toxic non inflammatory enlargement of thyroid gland

Types of Goitre:**1- Simple:**

- Physiological.
- Colloid.
- Nodular.

2- Toxic:

- Primary.
- Secondary.
- Toxic nodule.

3- Neoplastic: Thyroid carcinoma (benign tumors are rare).**4- Inflammatory.****5- Autoimmune goitre** as Hashimoto's thyroiditis and collagen diseases as Riedel's thyroiditis**6- Hypothyroid goitre.**

Hypothyroid gland فكله Huge thyroid لوفيت

Simple Goitre**Definition:**

Non-toxic, non-neoplastic, non-inflammatory thyroid enlargement. Essentially the patient is euthyroid.

Incidence:

- Sex:** Commoner in females.
- Age:** Usually starts at a young age especially in endemic areas.
- Residence:** Certain areas are endemic (oases), but sporadic cases appear anywhere.

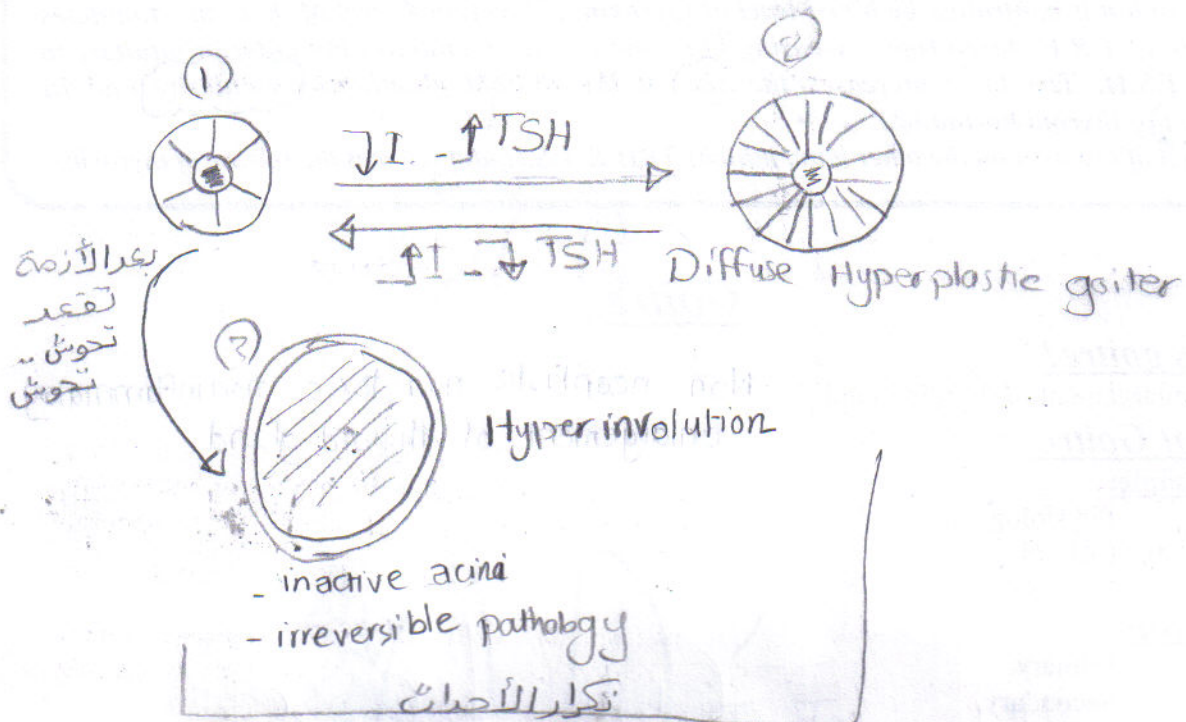
I deficiency enzymatic deficiency

Cause:

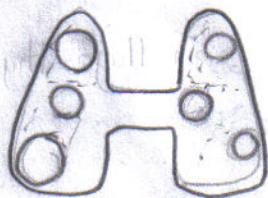
Simple goitre is due to persistent stimulation of thyroid gland by high TSH level. Increased TSH secretion is due to decreased production of thyroid hormones from:

1- Iodine deficiency:

- This may be absolute or relative.
- The normal daily requirement of iodine is 100-125 µg.
- Absolute deficiency:** Simple goitre is endemic in regions with low iodide content of the water.
- Relative deficiency:** Occurs during periods of stress e.g. females during the menarche, pregnancy and lactation.



Heterogeneity
 ↓
 Simple nodular goiter



nodules $\xrightarrow{w/c}$ inactive 3
 active follicles $\rightarrow$ internodular 1, 2

2- Enzymatic deficiency:

- Responsible for many cases of sporadic goitre.
- Positive family history is common.
- Examples:

1) **Pendred's syndrome** it is due to deficiency of peroxidase enzyme. There are goitre, deafness and mutism

2) **Deficiency of dehalogenase enzyme** MIT, DIT after binding before coupling Tyrosine و Iodine يفهم

3- **Goitrogens:** e.g.: Thiocyanates in cabbages, drugs as para-amino salicylic acid and antithyroid drugs. Large doses of iodides inhibit iodine binding, thus resulting in iodide goitre.

Pathogenesis (How does simple goitre develop?): مهم للفهم: بس عرّفه ما اتسأل

Stages of goitre formation:

- 1- Deficient synthesis of thyroid hormone leads to persistent TSH elevation that produces diffuse homogenous hyperplasia. All follicles are active (**diffuse hyperplastic goitre**) **this stage is reversible**, i.e. If the iodine requirements are satisfied, the follicles undergo involution.
- 2- Sometimes, when the iodine requirements are satisfied the follicles undergo hyperinvolution and become large in size, lined by flattened epithelium and full of colloid. (**Simple colloid goiter**). inactive irreversible pathology
- 3- Repeated fluctuations in the level of TSH due to repeated stresses which produce:
 - a. Repetition of this process of hyperplasia and involution.
 - b. Heterogeneity of the gland, with areas of active follicles and others with inactive follicles.
 - c. **Nodular goitre:** most nodules being inactive, the active follicles being present in the internodular tissue.

Immunoglobulins is one of the factors (other than TSH), which play a role in etiology of nodular goitre.

1- Physiological Goitre (Diffuse Hyperplastic Goitre)

Incidence: Usually in female at puberty (10-20y) during pregnancy and lactation.

Pathogenesis: See before.

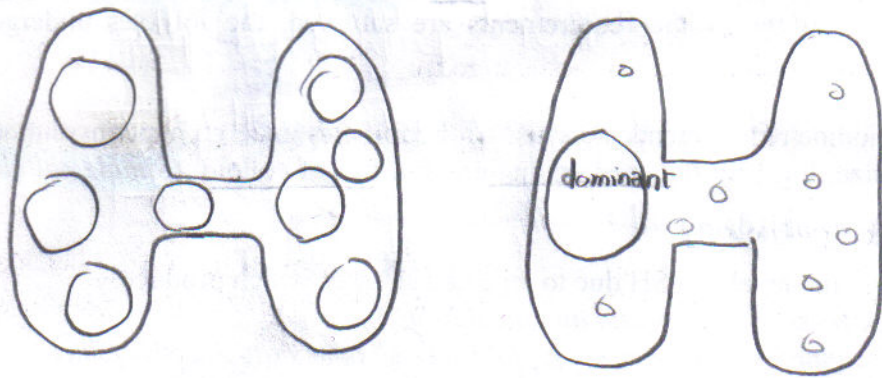
Gross Features: Regular, moderate, smooth, soft enlargement of the whole gland cut section is fleshy brown. Full neck

Histology: Diffuse hyperplasia. Acini are increased in number, lined with columnar epithelium and contain little colloid.

Clinical picture: The only symptom is fullness of lower part of the front of neck (Venus neck)

قانون

اوی تکتب لعیان دواء فیہ هر مونات (ونالذات کورتیزون) من غیر ما شرحه
.. لازم تشرحه



Signs: (Thyroid swelling)

Gross

- 1- Regular enlargement of the whole gland, which is butterfly shaped.
- 2- Moderate size.
- 3- Smooth surface.
- 4- Soft consistency.

Prevention: The use of iodized table salt (potassium iodide 1:10,000)

۱. آلف جدول ملع
+ جدول یو دین

Treatment:

- Usually reversible by the use of L-thyroxine, usually 0.2 mg/d for several months to be tapered to 0.1 mg/day for several years. **TSH**
- The patient is reassured and is advised for regular follow-up.

The patient is reassured and is advised for regular follow-up.

if treated e iodine → toxic → Jod Basedeau
 → Colloid

2- Colloid Goitre

Is an intermediate stage between physiological and nodular goitre.

Gross features: The gland is regularly or irregularly enlarged, soft and smooth. Cut section shows wide spaces filled with colloid.

Histology: Hyperinvolution. Acini are hugely distended with colloid and lined with flat epithelium. Adjacent acini may rupture and fuse together forming large cysts filled with colloid.

Clinical Picture:

The gland is enlarged with irregular surface and soft consistency.

3- Simple Nodular Goitre

Clinically there are 2 types:

- 1- **Diffuse simple nodular goitre** = More than one nodule is felt.
- 2- **Solitary simple nodular goitre** = One nodule is felt.

Incidence:

- 1- **Frequency:** It is the commonest type of goitre.
- 2- **Locality:** sporadic or endemic.
- 3- **Age:** 30-40 (younger if endemic).
- 4- **Sex:** Commoner in females.

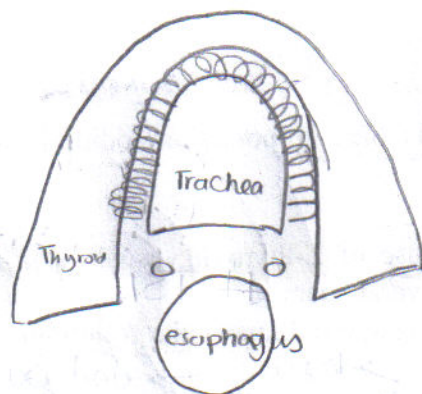
Pathogenesis: See before.

Gross features:

- Usually multiple nodules are grossly present.
- A dominant nodule may be present but microscopic changes are present throughout the gland
- Cystic degeneration, hemorrhage and calcification are common

Histology:

- 1- Dense fibrous stroma around nodules.



* How to diagnose tracheomalacia postoperatively ??

→ by Kokher's test

* Tracheomalacia is contraindication to thyroidectomy

→ لو شلنا ال thyroid ^{بتخون} لأ فاهي اللي مشبقة ال trachea
لو حصل نحل إيه

١- نرجعها بسرعة (نكتة) السبرويد لو اتشالت مترجعش

٢- نطلع غرزة من trachea بيضها كل ما يبجي ياخذ نفس
علشان يفتحها (نكتة برضه) ← بويو

٣- Tracheostomy (فعلاً)

فمن الأسماء دي في الجراحة

تنفوي

Kokher

1- Test to diagnose Tracheomalacia

2- Forceps

3- Incision

→ Subcostal: Cholecystectomy
→ Thyroidectomy

4- Reduction of Shoulder dislocation

Trendelenberge

1- Valve

2- Test بإخساره ملي

3- Test in exam. of hip joint

4- Position: e head down

5- Operation

→ V.V.

→ Pulm. embolism

Waldayer

1- Ring → Neck

2- Fascia: between Rectum & Sacrum

Thyroid & Other Endocrinal Diseases

A.H.

- 2- Nodules contain hyperinvoluted acini (colloid nodules which are **bulky** & **gelatinous**), distended with colloid and lined with flat epithelium.

N.B.: Most nodules are inactive. Active acini exist only in internodular tissue.

Clinical picture:

Symptoms: There are 2 groups of symptoms:

- 1- **Disfiguring swelling:** In lower part of neck of insidious onset, long duration & gradual enlargement.

- 2- **Pressure symptoms (by large goitre):**

- 1- **Dyspnea** from pressure on trachea.

It increases by sleeping on high or low pillow, so that it is called **postural dyspnea**.

It results from:

- Lateral kinking of trachea in unilateral goitre.
- Compression from both sides in bilateral huge goitre (**scabbard trachea**).
- Anteroposterior compression in retrosternal goitre.
- Prolonged pressure on trachea produces softening and easy collapse.

ازای بیچش
dyspnea

Cartilage تصبغ (tracheomalacia).

- 2- **Dysphagia** from pressure on esophagus (only retrosternal goitre).

Signs: The swelling shows the following characters:

- Butterfly shape** (Diffuse enlargement) or **localized lump** (adenoma) → **dominant nodule**
- In lower part of front of neck** (Muscular triangle).
- Moves up with deglutition** (being enclosed in pretracheal fascia).

N.B.: These 3 signs prove that the swelling is goiter

Through pretracheal fascia, the thyroid gland is suspended to thyroid cartilage & hyoid bone, which moves with deglutition. Ligament of Berry is a thickening of posterior part of pretracheal fascia that fixes the back of each lobe to the cricoid cartilage.

Swellings move with deglutition

Thyroglossal cyst, cervical ectopic thyroid, prelaryngeal & pretracheal L.N.s, subhyoid bursitis, parathyroid swelling

Thyroid swellings don't move with deglutition

Fixed by malignancy, Reidel's thyroiditis, scarring of previous operation, huge goiter.

- 4- **Size:** Variable.

- 5- **Surface:** Nodular.

- 6- **Consistency:** Firm or tense cyst.

If hard = calcification, malignancy, Reidel's thyroiditis. & **tense cyst**
If cystic = cystic degeneration, hemorrhage or suppuration.

- 7- **Border:** Well-defined (in retrosternal goitre: lower border can not be felt).

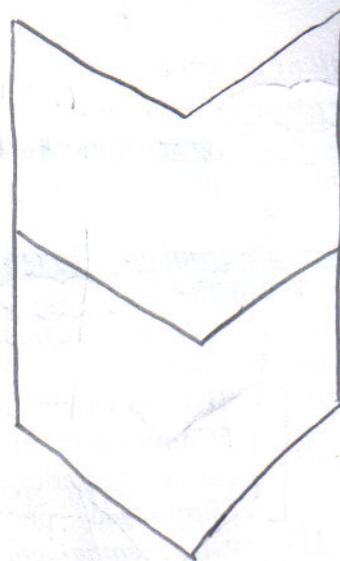
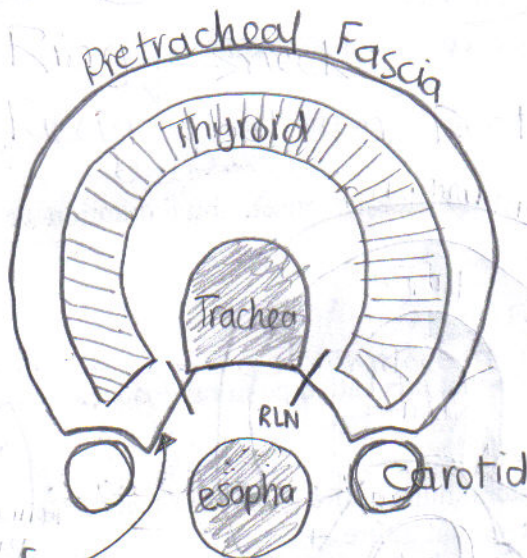
- 8- **Tenderness:** Not **except** if infection occurs in a nodule.

- 9- **No thrill or murmur** over the gland (only in toxic goitre).

- 10- **Transmitted pulsations** may exist (expansile in toxic goitre).

- 11- **Percussion** over manubrium sterni = dullness in retrosternal goitre.

قانون : ممنوع القرارات العنصرية في الطب



Ligament of Berry

⊗ Pretracheal Fascia

— Ligament of Berry

- upwards: oblique line of thyroid Cartilage
- Inferiorly: aortic arch
- laterally: Carotid Sheath

RLN may be injured due to excessive traction on pretracheal Fascia

شفوي : Types of calcification of thyroid by X-ray

Punctate (Papillary Carcinoma)

linear → around nodule
Simple Nodular Goiter

Patchy
Medullary Carcinoma

3% have RLN injury of unknown cause may be viral infection A.H.

Thyroid & Other Endocrinal Diseases

12- Relation of the swelling to surrounding structures:

- Skin:** Not attached (detected by pinching or sliding tests).
- Sternomastoid muscle:** Is superficial to the gland and is not attached to it (detected by pinching away the muscle, while the patient is swallowing).
- Trachea and larynx:** Are displaced to one side in unilateral or unequal enlargement (detected by insinuating the finger in suprasternal notch on sides of trachea). Simple goitre is not attached to larynx or trachea (detected by sliding the swelling vertically over them).
- Carotid pulse:** is only pushed laterally (absent carotid pulse denotes malignant infiltration = **Berry's sign**).

Biding تحضنه

Fixity of goitre to skin, sternomastoid or trachea denotes thyroiditis, malignancy or postoperative adhesions

Investigations:

- Routine lab & ECG.**
- Indirect Laryngoscopy** → **Obsolete**
- Plain X-ray** may show calcification and tracheal deviation or compression.
- Ultrasound** to detect cystic from solid lesions and can it can detect retrosternal goiter
- Thyroid function tests**, to exclude, hyper or hypothyroidism (not routine)
- Thyroid antibodies estimation**, to exclude autoimmune thyroiditis (Hashimoto's disease) (not routine).
- Biopsy (FNAC)** {not routine}

كليا لومش هتغل عليه رسيته على Sonar

Complications of simple nodular goitre:

- Malignancy** (Recent rapid enlargement + hard consistency) 3% usually follicular type.
- Toxicity** (producing secondary toxic goitre) 30%.
- Tracheal obstruction** by compression (see c/p).
- Infection** in a nodule (rapid enlargement, pain, warmth & tenderness).
- Cyst formation** (cystadenoma) from:
 - Degenerated nodule.
 - Rupture and fusion of adjacent colloid acini.
- Hemorrhage in a nodule or cystadenoma:**

Produces sudden enlargement of preexisting goitre. Severe dyspnea results if impaction occurs at thoracic outlet and **urgent treatment is essential: emergency**

 - Cold applications.**
 - Aspiration.**
 - Incision in skin and deep fascia** allowing the gland to bulge freely in the wound releasing the trachea until urgent thyroidectomy is done.
- Calcification in a nodule** (hard, simulating malignancy).
- Retrosternal extension** occurs usually in men due to stronger pretracheal muscles and shorter neck.
- Complications of treatment.**

Treatment of simple nodular goitre:

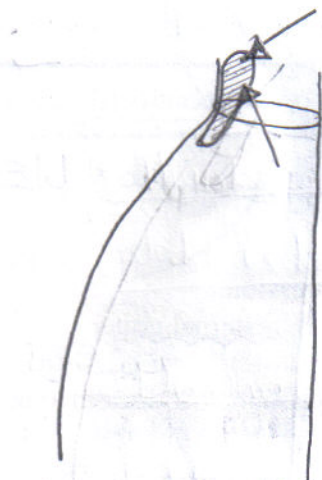
Surgery is indicated for:

- Evidence of compression** manifestations mainly upon the trachea.
- Cosmetic reasons.**
- Both lobes affected = Partial thyroidectomy (subtotal).
- Only one lobe affected = Hemi-thyroidectomy.

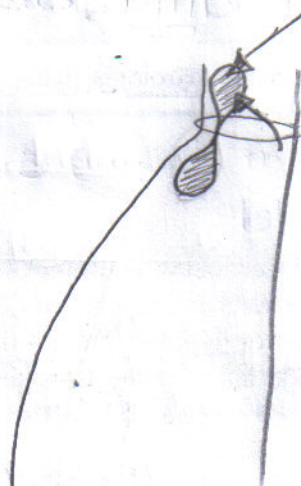
الرمش فتعملها غلية وهي Simple ندبها L-Thyroxine

منكبرش

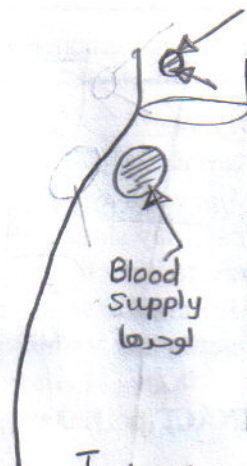
يمكن تصغير
heterogenous
Hyperplastic
Regression
يحصنها



plunging
نولدها

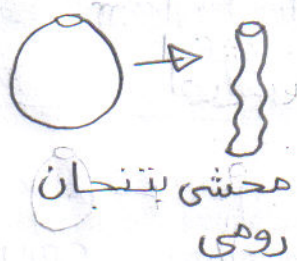


mediastinal
نشقها ونفقورها



Intrathoracic
Sternotomy

عكشان أربط ال
Vessels



N.B.:**histological Surprise**

- 1- Removed gland is sent for histological examination (biopsy).
- 2- After operation 0.1 mg L-thyroxin is given daily for life. To avoid recurrence by inhibiting TSH stimulation. *فيه عيائش مبرصوش ياحنه (هرهوات) وفيه جراحين مبرصوش يروه*
- 3- Surgery should not be advised below the age of 25 unless very much indicated as it may be followed by recurrence. *مممكن تتعمرن - stresses كثير*

Retrosternal Goitre**Definition:**

- Goitre in superior mediastinum.
- It is an anatomical, not pathological diagnosis. *Any type ممكن تكون*

Pathology:

Retrosternal goitres usually arise in a normally placed thyroid gland. The sternohyoid and sternothyroid muscles prevent forward expansion, and assisted by gravity and the negative intrathoracic pressure, they direct the swelling into the mediastinum.

In most cases, the intrathoracic swelling occupies the superior mediastinum, but occasionally it lies in the posterior mediastinum behind the trachea, and sometimes behind the esophagus.

Retrosternal goitre is classified into 3 types:

- 1- **Plunging goitres**, which rise with deglutition and descend again through the thoracic inlet.
- 2- **Mediastinal goitres**, which lie wholly in the chest, but are connected with the thyroid by a relatively narrow band of tissue and derive their blood supply from the thyroid vessels.
- 3- **Intrathoracic goitres**, which lie wholly in the chest, completely separate from the gland. They probably arise from congenitally misplaced thyroid tissue, deriving independent blood supply from mediastinal vessels.

Clinical features:*Retrosternal**muscle bulk*

- 1 ☐ Anterior thoracic goiter is **more common in men** particularly **short-necked individuals**.
- 2 ☐ It often remains **symptomless for years**. *بتخاف من الضلعة*
- 3 ☐ **Dyspnea** from compression of the trachea, it gets worse at night and aggravated with lying down or flexion of the neck.
- 4 ☐ **Cyanosis and edema** of the face and neck.
- 5 ☐ **Dilatation of superficial veins of the upper part of the chest** due to obstruction of the innominate veins (D.D. congestive heart failure).
- 6 ☐ **Dysphagia** may be present.
- 7 ☐ **Palpation** of the neck may reveal an enlarged thyroid gland (the lower edge cannot be felt).
- 8 ☐ **Percussion** of the sternum may reveal retrosternal dullness.
- 9 ☐ **Symptoms and signs of toxicity or malignancy may be present.**

*Types of Thyrotoxicosis

Common

- 1- 1^{ry} toxic goiter = diffuse toxic goiter = Grave's disease
- 2- 2^{ry} toxic goiter = toxic nodular goiter = Plummer's disease
- 3- Toxic nodule

1- Thyrotoxicosis factitia: $\uparrow\uparrow$ L-thyroxine $> 0.2-0.3$ mg/day

2- Jod Basedow thyrotoxicosis: $\uparrow\uparrow$ iodine $\rightarrow$ in physiological goiter

③ De Quervain's disease : Subacute thyroiditis
 موقوف على قدحاله يبيع الى جيلته علسان يقششع الناس
 ويترن اصرابه اللي ع القوة لحدما يتفزع ويعفوا انه فقير لما يبيع كل الى جيلته
 كان ياي عليه مترش (toxic) بس في الحقيقة ده علسان وكحيان (intake)

4- Hashitoxicosis: 5% Hashimoto's disease - toxic in early stage
 thyroid = كانت بتكسر نفسها علسان تطلع هرمونات زيادة

5- Functioning thyroid Carcinoma: Very rare

6- Neonatal thyrotoxicosis: neonates of thyrotoxic mothers $\rightarrow$ transmission of antibodies across placenta

7- TSH ~~thy~~ secreting adenomas of pituitary

8- T₃ Thyrotoxicosis: more in elderly

9- Apathic thyrotoxicosis

10- Latent thyrotoxicosis = $\acute{e}$ impalpable gland

11- Monosymptomatic goiter: e.g. $\rightarrow$ loss of weight
 $\rightarrow$ Arrhythmia
 $\rightarrow$ Fall of hair

Rare

شغوى: مين عيان toxic وعنده uptake قليل؟؟

Thyroiditis $\leftarrow$

Special tests: تصديق Thoracic outlet ← يرفعوا الرأس لافوق

- Ask the patient to raise up both arms or to tilt her/his head to one side strongly & keep this position for a while → Congestion of the face & distress occurs due to obstruction of great veins & trachea at thoracic inlet.

Investigations:

- 1- Chest X-ray shows a soft tissue shadow in superior mediastinum.
- 2- Sonar.
- 3- Thyroid scan.
- 4- C.T. Scan.

Treatment:

Surgery is always essential. Cervical part of goitre is dealt with as usual and its vessels ligated. This step avoids the risk of hemorrhage, as retrosternal goitre takes its blood supply from neck.

Retrosternal goitre is dealt with by:

- 1- Gentle pulling to deliver it in neck.
- 2- Piecemeal removal from within the capsule to collapse the goitre and then pull it up in neck.
- 3- Only if retrosternal goitre is malignant or intrathoracic, sternal split is needed (median sternotomy)

N.B.: Preparation of toxic cases is only by Inderal, as antithyroid drugs are (goiterogenic)

Toxic Goitre (Thyrotoxicosis)

- True exophthalmos
- Pretibial myxedema
- Thyroid Acropathy / Cyanosis / Clubbing

The term thyrotoxicosis is better used, as not all manifestations are a direct effect of elevated thyroid hormones, e.g. True Exophthalmos and pretibial myxedema.

Common types:

- Diffuse toxic goitre (primary toxic goitre = *Grave's disease*).
- Toxic nodular goitre (secondary toxic goitre = *Plummer's disease*).
- Toxic nodule.

المناعة الذاتية
autoimmune
autonomous
nodule

Rare causes of hyperthyroidism:

- 1- Thyrotoxicosis factitia: due to excess intake of L-thyroxin (> 0.2 - 0.3 mg per day).
- 2- Jod-Basedow thyrotoxicosis: Occurs in cases of physiological goitre upon the administration of large doses of iodine (iodine induced toxic goitre)
- 3- Subacute thyroiditis: (*De Quervain's diseases*).
- 4- Hashitoxicosis: 5% of patients with Hashimoto's disease may have hyperthyroidism in the early stages of the disease.
- 5- Functioning thyroid carcinoma. very very very rare
- 6- Neonatal thyrotoxicosis may occur in newborns of thyrotoxic mothers due to transmission of thyroid antibodies across the placenta.
- 7- TSH secreting adenomas of pituitary gland

8- T₃ Thyrotoxicosis: more in elderly

9- Another thyrotoxicosis

10- Latent thyrotoxicosis: toxic goiter with impalpable gland

11- monosymptomatic goiter: loss of weight - arrhythmia - fall of hair

بعض السلا Thyroid antibodies

LATS Long acting thyroid Stimulating

LATSP " " " " (protector)

إيصال evidence إلى toxic goiter ← Autoimmune

- 1-Antibodies detected in blood
- 2-microscopic picture of lymphocytic infiltration
- 3-Reticulo-endothelial hyperplasia

شفوى واحدة وقفلك ورا ستارة وطلعتك ايديها
ازاي تعرف

toxic	Neurotic	الدكتور في الشفوى:
warm moist	warm dry	

حسب: يعتبرها Neurotic عاطول مدام واقفة ورا ستارة ومطعالي ايديها
قناوى: يشدها من ورا الستارة ويشوفها (ايديها مش كافية)

أم كلثوم أشهر toxic goiter في تاريخنا

dry toxic

الأمريكان خافوا يعملوها عليه يعوروا RLN يتاخ أم كلثوم

1- Primary toxic Goitre

There is diffuse enlargement of the whole thyroid gland accompanied by the clinical picture of thyrotoxicosis.

Incidence:

- Females: males = 8:1.
- Usually 20 - 40 years.
- Usually associated with unilateral or bilateral exophthalmos in 85% of cases.

Etiology:

- It is an autoimmune disease, which leads to formation of abnormal thyroid stimulating antibodies leading to stimulation of T.S.H. receptors on the thyroid cell membrane resulting in an action on the thyroid cell similar to T.S.H but prolonged. ① ② ③ ④
- The disease is often precipitated by psychic trauma, emotional stress, acute infections, pregnancy or labor. ⑤

Pathology:

1- Thyroid:

- The gland is highly vascular and friable.
- Gross picture: There is diffuse small or large, smooth, soft or firm enlargement of thyroid gland. + Friable due to high vascularity
- Cut section: Homogenous, reddish brown & fleshy appearance.
- Microscopic picture:
 - The acini:
 - Hyperplasia and hypertrophy.
 - The acini contain no or little colloid.
 - The stroma:
 - There is increased vascularity with A-V shunts.
 - Dense lymphocytic infiltration.



2- On other organs:

- There is hyperplasia of the R.E.S.

Clinical picture:

a. Local manifestations:

- 1- Moderate, regular diffuse thyroid enlargement, with minimal pressure effects.
- 2- Smooth surface.
- 3- Soft consistency, (less commonly firm).
- 4- Evidence of high vascularity:
 - i) Systolic expansile pulsations.
 - ii) Thrill (on palpation) and bruit (on auscultation) maximum at upper poles, where superior thyroid arteries lie superficial.

b. Systemic manifestations:

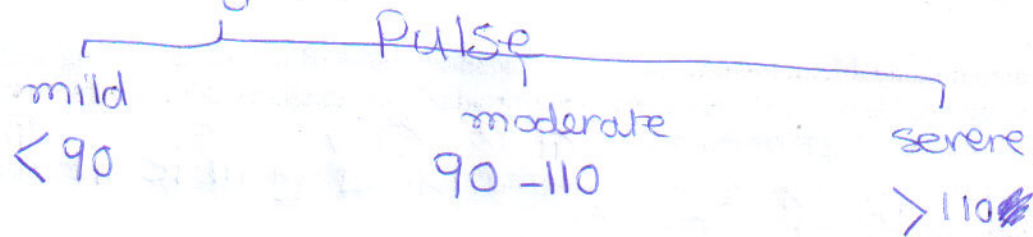
1- Metabolic:

- Loss of weight in spite of increased appetite.
- Excessive sweating.
- Intolerance to hot weather.
- The hands of the patient are warm and moist.

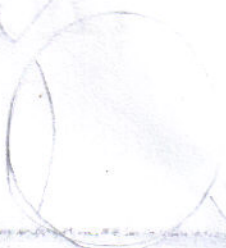
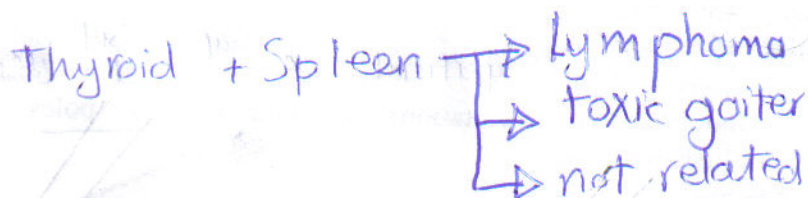
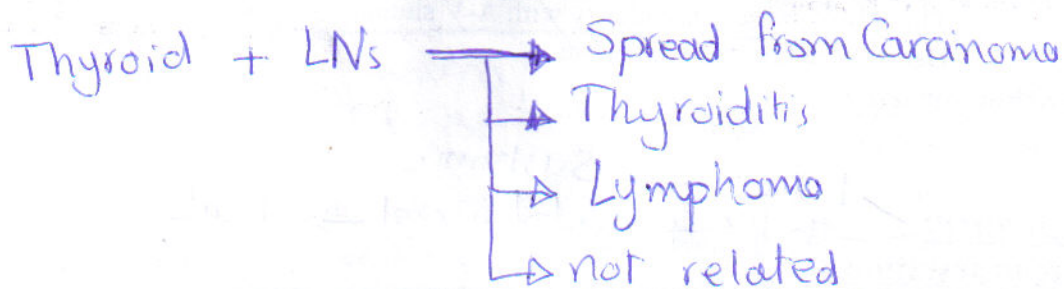
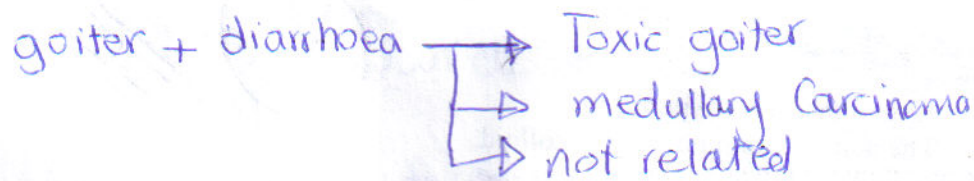
Sites of tremor

- 1- Outstretched hand
- 2- Protruded unsupported tongue
3. lightly closed upper eye lid

Toxic goiter



don't diagnose Toxic goiter if pulse < 80
except ~~after~~ under ttt



2- Nervous system:

- Symptoms:

- Nervousness, insomnia or nightmares.

- Signs:

- The patient looks tense and irritable.
- Tremors in the outstretched hands.
- Exaggerated reflexes.

← Hammer *الدرجات العنيفة*

3- Cardiovascular system:

- Symptoms:

- Palpitation.
- There may be anginal pains. ↑ demand *قلبي يجري*
- Orthopnea, pain in the right hypochondrium and edema of the lower limbs (in case of H.F).

- Signs:

- Tachycardia with a sleeping pulse more than 90/minute.
- Water hammer pulse is due to high systolic (due to increased cardiac output) and low diastolic blood pressure (due to decreased peripheral resistance).

Sedated Pulse

- Arrhythmias: all types of cardiac arrhythmias except heart block may occur.

4- Muscular:

- Muscular weakness with rapid exhaustion.
- In severe cases proximal myopathy and muscle atrophy may occur.

5- Skin:

- Patchy pigmentation may occur.

- Pretibial myxedema: always bilateral - always associated *é true exophthalmos*

1. Presents as multiple orange yellow patches of thickening of the skin over the shin of the tibia.

2. They are due to deposition of mucin like substances.

3. Always associated with true exophthalmos

6- Gastrointestinal tract: Diarrhea.

7- Endocrine system:

- In female: Menstrual abnormalities.
- In males: Abnormal libido, gynecomastia or impotence.

8- Urinary system: Polyuria and glycosuria.

- 1- Thyroid hormones are diabetogenic
- 2- ↑↑ blood flow to kidney (hyperdynamic circulation)
- 3- ↑↑ metabolic rate

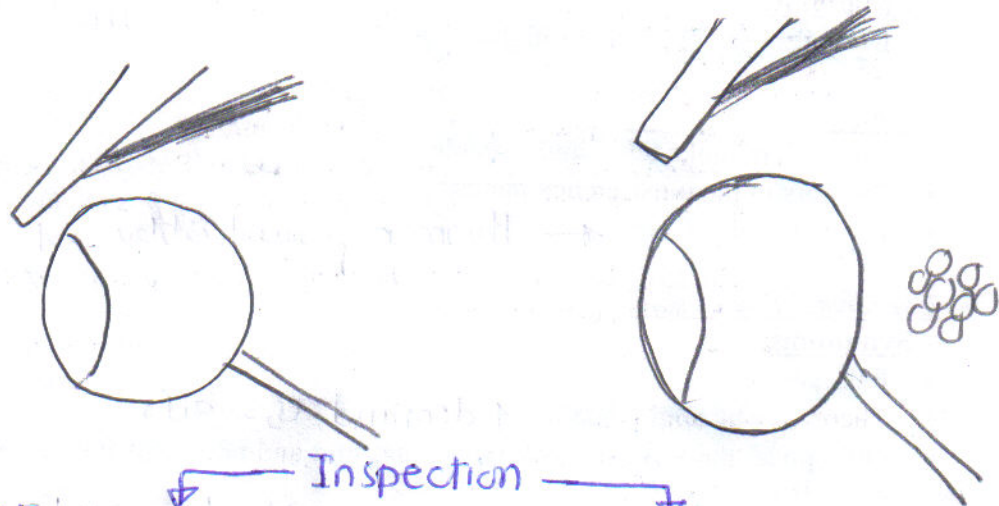
9- Eye manifestations:

- Symptoms:

- Blurred vision.
- Diplopia.
- Pain and photophobia (corneal ulcers).

الحركة باركة

- Excessive tearing.
- Swollen black eyelids.
- Bulging.



- Inspection
- 1- Staring Look
 - 2- Lid Lag
 - 3- Rim of sclera above cornea
 - 4- lack of wrinkling of Fore head
 - 5- lack of convergence
- حركة صباع

In case of recent progressive exophthalmos

avoid → Sudden termination } may lead to
 → hypothyroidism } malignant exophthalmos

EPS = Exophthalmos Producing Substance

arise from ant. pituitary, may be stimulated by hypothyroidism

Thyroid & Other Endocrinal Diseases**Signs:**I- **Tremors:** Detected in lightly closed eyelids.II- **Exophthalmos:** May be false or true.**False exophthalmos:**

- It accompanies both 1st and 2nd toxic goitres.
- **Etiology:** It is due to contraction of the levator palpebrae superioris (Muller's muscle) pulling the upper eyelid's tarsus and superior conjunctival fornix upwards.
- The high level of thyroid hormones sensitizes this muscle to the effect of circulating catecholamines.
- **Treatment:** It usually disappears when the hyperthyroidism is treated.

True exophthalmos:

- There is actual protrusion of the eyeball.
- **Etiology:** Deposition of fat and round cell infiltrate in the retrobulbar tissues ^{and} it may be an autoimmune disease due to thyroid stimulating antibodies affecting the ocular muscles.
- **Results:**
 - 1- Ophthalmic vein compression, leading to edema, conjunctival congestion and chemosis.
 - 2- Weakness of extra-ocular muscles results in diplopia.
 - 3- In severe cases papilledema and corneal ulceration may occur. The severe progressive form is known as malignant exophthalmos.

Clinical detection of exophthalmos:i- **Naffziger's method:** من وراء

- The examiner stands behind the patient, with the head tilted backwards.
- In true exophthalmos the eyeballs protrude beyond the plane of the superciliary ridge.

ii- **Russell Frazer's method:** من الجنب

- Examining the patient from the side with the eyes lightly closed, will determine the depth of the groove between the orbital margin and the covered globe (shallow in true exophthalmos).

iii- **Ruler test:** من قدام

- Examiner uses ruler & tries to rest its edge in front of eyeball on the supraorbital edge & zygoma.
- Normally, it doesn't touch the cornea.

iv- **Exophthalmometer:** جهاز**Treatment:**

Usually self-limiting and may even regress.

- 1) Sleeping in the semi-sitting position and lateral tarsorrhaphy may help to protect the eyes.
- 2) High doses of systemic prednisone may be helpful.
- 3) Orbital decompression may be indicated when the eye is endangered.

N.B.: Hypothyroidism may increase the condition.**III- Eye signs, other than exophthalmos, include:**

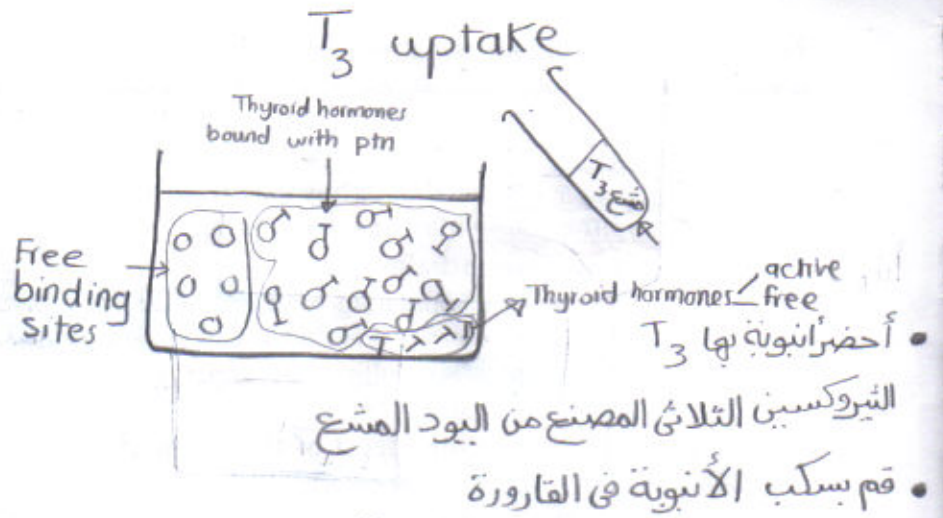
- i) **Stellwag's sign:** staring look with infrequent blinking (normal blinking 5-8 /min).
- ii) **Von Graefe's sign:** the upper eyelid lags behind the moving eyeball as the patient looks down without moving the head.

1 = 1000 milli

1 milli = 1000 μ

μ = 1000 nano μ

nano = 1000 pico P



• بقطعة من الزجاج قلب القارورة جيداً

• كل T_3 المشع هيمسك في Free binding sites

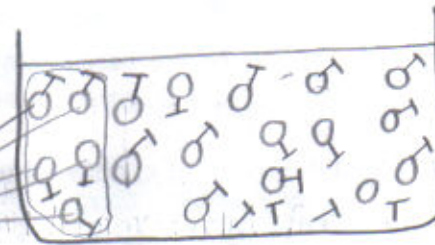
• لاحظ الاشعاع المنبعث من ال serum الذي في القارورة

الطبيعي ٥ إشعاعات (٤ : ٦) ← ١٠٠٪

T_3 مارادونا

- rapid action
- Short half life
- more free

T_4 اللاعب المصري



100% [٤ : ٦] (٥) إشعاع

• لو أكثر من الطبيعي Hypothyroidism أكثر من ٦ $> 120\%$

• لو أقل من الطبيعي Hyperthyroidism أقل من ٤ $< 80\%$

- iii) **Dalrymple's sign:** appearance of a rim of sclera between the upper eyelid and the cornea.
- iv) **Joffroy's sign:** lack of forehead wrinkling on looking upwards without moving the head.
- v) **Moebius sign:** defective convergence due to muscle paresis (for 30 cm at least).

• **Thyrotoxicosis should be suspected in:**

- Children with growth spurt, behavioral problems or myopathy.
- Elderly persons with unexplained tachycardia or arrhythmia (apathetic hyperthyroidism).
- Unexplained diarrhea.
- Unexplained loss of weight.
- Resistant heart failure.

monosymptomatic toxic goiter

Differential diagnosis:

- 1) **Primary thyrotoxicosis** should be differentiated from **secondary thyrotoxicosis:**

	Primary thyrotoxicosis	Secondary thyrotoxicosis
1- On top of	Normal thyroid gland.	Simple nodular goitre.
2- Exophthalmos	True in 85% of cases.	Only apparent due to thyroxin.
3- Histology	Diffuse hyperplasia.	Hyperplasia of internodular tissue.
4- Age of onset	Younger (20-40).	Older (over 40).
5- Onset	Rapid, after stress.	Gradual.
6- Course	Fluctuating.	Progressive.
7- Degree	Usually severe.	Usually mild.
8- Main toxic presentation	Metabolic & nervous.	Cardiovascular, due to older age.
9- Local signs	Smooth regular goitre, small or moderate, with no pressure effects. High vascularity	Nodular goitre may be huge. High vascularity
10- Treatment	Drugs, surgery, radioiodine.	Surgery is the best.

- 2) **Other causes of goitre.**
- 3) **Other causes of loss of weight in spite of increase of appetite e.g. parasitic infestations & D.M.**
- 4) **Anxiety neurosis.**

Investigations:

- Thyroid function tests T_3 , T_4 , TSH and ^{123}I uptake test confirm the diagnosis.
- T_3 thyrotoxicosis is identified by elevated free T_3 .
- Toxic adenoma shows as a hot nodule on ^{123}I scanning with suppression of the uptake of the surrounding thyroid tissue.

dominant nodule

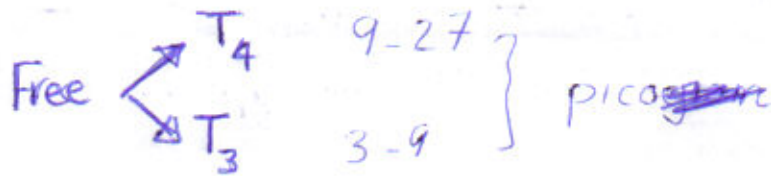
البنت العاقبة

Thyroid functions tests

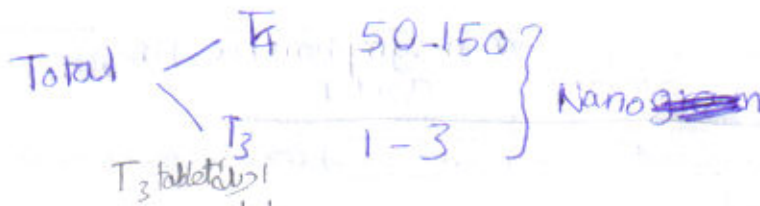
- 1) **Free T_3 & T_4 in the serum: (measured by radioimmunoassay).**

Normal values:

- a) Free serum T_4 = 8 - 26 pmol/L.
- b) Free serum T_3 = 3-9 pmol/L (essential if T_3 thyrotoxicosis is suspected).

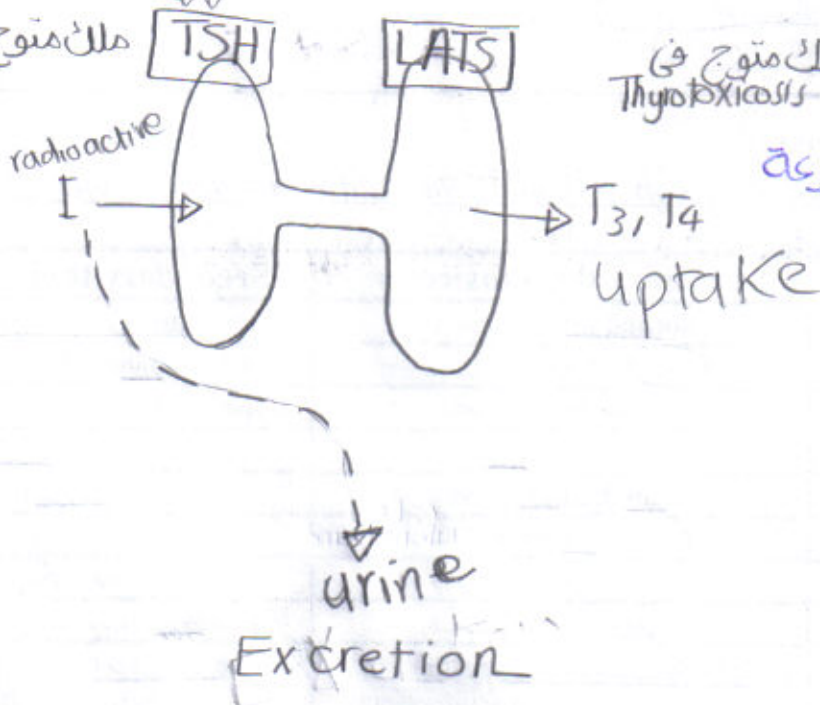


$T_3 \leftarrow$ free ربع
 $T_3 : T_4$
 $3 : 9 = 1 : 3$



$T_3 \leftarrow$ total $\frac{1}{50}$
 $T_3 : T_4$
 $1 : 50$

normal ملك متوج في



ملك متوج في
Thyrotoxicosis

T_3
يتخلط من الرقابة بسرعة
 $\downarrow$
ما رادونا

2) Total T3 and T4 in the serum: (measured by radioimmunoassay).

Normal value:

- a) Total serum T4 = 55 - 150 nmol/L.
- b) Total serum T3 = 1.2 - 3.1 nmol/L.

3) T3 uptake test:

- It measures the number of free binding sites in the serum, which is low in thyrotoxicosis, and high in myxedema.
- **Method:** Radioactive T3 is incubated with the patient's serum → T3 will bind to the free thyroid binding proteins → estimate the number of free binding sites in the serum.
Normal = 80 - 120% < 80 = toxic > 120 hypothyroid

4) Free thyroxine index and free tri-iodothyronine index:

- FT4I = Total serum T4 x 100/T3 uptake percent = 55 - 145. 50-150
- FT3I = Total serum T3 x 100/T3 uptake per cent = 1.4 - 3.7 1-3
- These normal values are increased in thyrotoxicosis.
- This is the best method to test thyroid function.

5) Estimation of T.S.H in the serum by radioimmunoassay.

6) T.R.H. test:

- I.V. Thyrotropin releasing hormone.
- Normal: Rise of T.S.H. level in the serum.
- In thyrotoxicosis: No rise in T.S.H level in the serum.

7) Radioactive iodine studies:

¹²³I is ideal as it has short half life (11 hrs.) while it is 8 days in ¹³¹I. Therapeutic

Radioactive iodine studies include:

a- ¹²³I uptake by thyroid gland and excretion in urine: (ordinary iodine is I¹²⁷)

- 5 microcuries of ¹²³I is given orally → the uptake by the thyroid gland and the amount excreted in urine are measured at 4, 24 and 48 hours.
- In thyrotoxicosis: Very high dose of ¹²³I is taken rapidly by the thyroid gland with little excretion in urine → ¹²³I is discharged rapidly from the gland.

b- Scanning of the thyroid gland:

Using a special apparatus after giving a dose of ¹²³I, Technetium 99m or recently fluorescent scanning values.

Values:

- 1) It gives an idea about the size and the shape of the gland.
- 2) Differentiate hot nodule i.e. increased activity (toxic) from a cold nodule i.e. decreased activity (cyst or malignant nodule).
- 3) Detect ectopic thyroid tissue e.g. thoracic or lingual.
- 4) Detect functioning thyroid metastasis.
- 5) It detects retrosternal extension.

8) T3 suppression test: (done only if ¹²³I uptake is high).

- Normal: ¹²³I uptake by the thyroid gland can be suppressed by giving T3 for 7 days.
- In thyrotoxicosis T3 has no effect.

10) E.C.G. & Basal metabolic rate (B.M.R)

Factors that determine type of ttt

1- Type

2- Pregnancy

3- Thyrocardiac یا شیلو یا کسرها

4- Recent exophthalmos

5- ↑↑ thyroid Antibody titre

11) Blood examination:

In thyrotoxicosis there are:

- a- Hypercreatinemia: N: less than 1 mg%. → muscle destruction (myopathy)
- b- Hypocholesterolemia: N: 150 - 250 mg%. → Thyroid hormone is the only hormone that lowers cholesterol
- c- Hyperglycemia: N: 120 mg%.

Treatment of thyrotoxicosis:

- Non - specific measures: For all cases:

- 1) Rest.
- 2) Sedatives.
- 3) Nutritious diet and excess fluids.

B- Specific measures to control thyrotoxicosis:

- Include anti-thyroid drugs, surgery and radioiodine.

- Each patient is considered separately and one measure or a combination of measures is chosen for him.

* Choice depends on the following factors:

- 1- Intelligence.
- 2- Socioeconomic factors.
- 3- General fitness.
- 4- The available medical facilities.
- 5- Age.
- 6- Pregnancy.
- 7- Cardiac complication (thyrocardiacs).
- 8- High thyroid antibodies titer. → medical ttt
- 9- Recent exophthalmos.

10- Type of thyrotoxicosis: examples:

a) Primary toxic goitre: Surgery, anti-thyroid or radioiodine.

b) Secondary toxic goitre: Surgery is always better because:

- 1- Incomplete response to anti-thyroid drugs and radioiodine.
- 2- Usually large with cosmetic and pressure effects and liable to all complications of nodular goitre.

c) Toxic nodule = Surgery or radioiodine.

- Excision is easy and safe.
- Radioiodine is theoretically ideal, as suppressed thyroid tissue around the nodule will not take radioiodine, with no risk of delayed thyroid insufficiency.

d) Recurrent thyrotoxicosis after adequate surgery: Radioiodine or anti-thyroid drugs.

e) Failed anti-thyroid drugs or radioiodine = Surgery.

f) Suspected malignancy = Surgery.

g) Retrosternal goitre = Surgery, anti-thyroid drugs enlarge the goitre causing suffocation.

خبرني في الآخر
Hypothyroidism

Treatment of Thyrotoxicosis:

A) Non - Specific: 1) Rest

2) Sedatives

3) Nutritive diet and excess fluid.

B) Specific:

1) Antithyroid drugs

2) Radioactive iodine

3) Surgery.

Each Patient Is Considered Separately And One Measure Or A Combination Of Measures Is Chosen For Him

	Medical Treatment	Radioactive Iodine	Surgery
Aim	1- Restore pt to an euthyroid status then... 2- Prescribe a maintenance dose for a prolonged period hoping for permanent remission. → 40%	Destroy the thyroid cells thus reducing the mass of functioning thyroid tissue.	1- Decrease the mass of overactive tissues... OR 2- Removing All the overactive tissue in case of toxic nodule.
Indications	1- 1ry thyrotoxicosis. 2- Mild thyrotoxicosis. 3- Small gland. 4- Children and young patients. 5- Pre-operative preparation. 6- Post-operative recurrence. 7- Refusal of surgery. 8- Unfit for surgery.	1- Diffuse toxic goitre (> 25 years). 2- Thyrocardiac patients. 3- Recurrence after surgery. 4- Refusal of surgery. 5- Toxic nodule	1- 2ry toxic goitre. 2- Severe 1ry thyrotoxicosis. 3- Retrosternal toxic goitre. 4- Huge goitre. 5- Suspicious of malignancy. 6- Failure of medical treatment. 7- Occurrence of side effects due to medical tr. 8- Thyrocardiac after proper preoperative prep. 9- Pregnancy. 10- Toxic nodule.
Contraindications	1- Toxic nodular goitre. 2ry toxic 2- Retrosternal goitre. 3- Huge goitre causing pressure symptoms. 4- Suspicious of malignancy. 5- Leucopenia or agranulocytosis. 6- Pregnancy and lactation.	1- Below the age of 25 years. 2- Retrosternal goitre. 3- Huge goitre. 4- Suspicious of malignancy. 5- Pregnancy and lactation. 6- 2ry toxic goitre.	1- Mild cases. 2- Young patient. 3- Recurrence after surgery.
Method	• Methods: a) Sedatives: Aim: To insure complete mental rest and good night sleep. b) Indral: (β blocker) Action: ↓ HR and palpitation. • Partially ↓ conversion of T ₄ to T ₃ . Dose: 10-40 mg t.d.s orally. c) Antithyroid drugs: Start its effect after 2 weeks. Aim: Control thyrotoxicosis gradually till euthyroid state is reached.	• Dose: 160 μCi / gm of thyroid tissue. Improvement occurs by 8-12 weeks (2-3 months) If not a second dose may be required.	• Pre-Operative Preparation: a) Routine method: 1- Medical treatment. 2- Neomercazole (till euthyroid state is reached) 3- Lugol's iodine 10-14 days immediately before surgery to ↓ vascularity and friability of the gland. b) Rapid Preparation: (β adrenergic blockers) Aim: Rapid control of C.V manifestations. Action: Acts on Target organ and not on the thyroid itself. So, it must be continued for 1 week after the operation.

Yasmin Bassiouny

• Preparations: 1) Lugol's iodine: (5% I - 10% KI) Indication: Only in preoperative prep. Action: ↓ TSH effect on thyroid gland. ↓ Vascularity of gland & irradiability ↓ Iodine binding. Storage of colloid. It's action declines after 2 weeks. Dose: 10 drops t.d.s with milk or juice to mask the bitter taste. 2) Carbimazole: The Commonest Action: Blocks iodine binding. ↓ Antibody titre. Dose: 10 mg t.d.s till euthyroid state is Reached (2 months), then 5 mg t.d.s For 12-18 months. • 0.1 mg/ day thyroxine with antithyroid drugs to decrease danger of: 1-Producing iatrogenic hypothyroidism. 2-Prevent goitrogenic effect (↑ size of gland). 3) Propylthiouracil: (not used) Action: Blocks iodine binding to tyrosine. • Prevents peripheral conversion of T_4 to active T_3. 4) Potassium Perchlorate: (not used) Action: ↓ Iodine trapping by the thyroid.	• Special problems: Thyrotoxicosis with pregnancy: -Radioiodine is absolutely contraindicated → destruction of fetal thyroid may result. -Antithyroid drugs at usual dose result in fetal hypothyroidism with goitre obstructing airway. <i>→ dose decreases the risk.</i> -Surgery after short course of antithyroid and propranolol proved to be safe during 2nd trim. Thyrotoxicosis in children: -Radioiodine is contraindicated. -Surgery shows high recurrence rate. -Antithyroid drugs until late teens. Thyrocardiac patient: -Thyroidectomy is ideal after control of the cardiac state. -In Unfit patients: radioiodine is used with antithyroid drugs until the effect of the former appears (6 weeks). Prognosis of recent onset: -Not preferable to terminate the toxic status abruptly by surgery or radioiodine for fear of the risk of malignant exophthalmos. -Antithyroid drugs are used until the prognosis becomes stable for 6 months after which thyroidectomy is permissible or radioiodine.	• Operation: The following precautions should be considered: 1) Incision should be <u>wide</u> with division of the pretracheal muscles, thus manipulation is minimal to avoid thyroid crisis. 2) The operation done is... SUBTOTAL THYROIDECTOMY Principle: • The main mass of the gland is removed leaving only a thin postmedial wedge of each lobe. WHY? -To maintain an euthyroid state. -To preserve the parathyroid. -To protect the recurrent laryngeal nerve. • The amount of the gland left is 4-5 gm on each side. • Perfect haemostasis and free drainage to avoid thyrotoxic crisis. <i>normal lobe ← Simple 4 gm = usual thumb</i>	1) Rapid cure. 2) High rate of success. 1) Morbidity and Mortality (negligible in experienced hands). 2) Recurrence rate (< 5%) 3) Thyroid insufficiency (20 - 45%) <i>So, the thyroidectomy is a safe procedure</i>
• Advantages 1) Avoid Surgical Risk. 2) Avoid possible hazards of radioactive I. 1) No way to predict which patient is liable to remission. 2) High relapse rate: 60% within 2 years from stop of treatment. 3) Further enlargement of the gland. 4) Adverse effects of drugs: Thiouretil: GIT upset, rashes, arthralgia. And: agranulocytosis (due to Carbimazole: reversible bone marrow dep.) BI. Picture must be done every 2 weeks.	• Disadvantages 1) Avoid Surgical Risk. 2) Avoid prolonged medical therapy 1) Thyroid insufficiency in up to 75-80% of cases after 10 years, so follow up is a must. → 4-5 gm 2) It's inadequate for treatment of cr. toxic goitre.	• Advantages 1) Avoid Surgical Risk. 2) Avoid possible hazards of radioactive I. 1) No way to predict which patient is liable to remission. 2) High relapse rate: 60% within 2 years from stop of treatment. 3) Further enlargement of the gland. 4) Adverse effects of drugs: Thiouretil: GIT upset, rashes, arthralgia. And: agranulocytosis (due to Carbimazole: reversible bone marrow dep.) BI. Picture must be done every 2 weeks.	• Disadvantages 1) Avoid Surgical Risk. 2) Avoid prolonged medical therapy 1) Thyroid insufficiency in up to 75-80% of cases after 10 years, so follow up is a must. → 4-5 gm 2) It's inadequate for treatment of cr. toxic goitre.

A- Medical Treatment:

- **The aim** is to restore the patient to an euthyroid status, then to prescribe a maintenance dose for a prolonged period in the hope that a permanent remission occurs.

- **Indications:**

- 1) Primary thyrotoxicosis.
- 2) Mild thyrotoxicosis.
- 3) Children and young patients.
- 4) Pre-operative preparation of patients.
- 5) Post-operative recurrence.
- 6) Refusal of surgery.
- 7) Small gland.

- **Contraindication:**

- a) Toxic nodular goitre.
- b) Huge goitre causing pressure symptoms.
- c) Retrosternal goitre.
- d) Suspicious of malignancy.
- e) Leucopenia or agranulocytosis.
- f) Pregnancy and lactation.

- **Methods:**

- a- **Sedative:** ensure complete mental rest & good night sleep.
- b- **Inderal (B-blocker)** to decrease the heart rate and palpitation and partially inhibit conversion of T₄ to T₃. **Dose:** 10 - 40 mg T.D.S. orally.
- c- **Anti-thyroid drugs:**
Onset: Anti-thyroid drugs start to give their clinical effect after 2 weeks, thereafter it control thyrotoxicosis gradually till euthyroid state is reached.

- **Preparations:**

- 1- **Lugol's iodine (5% I + 10% KI).**

Indication: Used only in preoperative preparation.

Effect:

1. Reduces the effect of TSH on the thyroid gland and inhibits iodine binding.
2. Reduces the vascularity of the thyroid gland.
3. Leads to storage of colloid within the acini.
4. Its action declines after 2 weeks.

Dose: 10 drops tds with milk or juice to mask the bitter taste.

- 2- **Carbimazole:** It blocks iodine binding to tyrosine and decreases antibody titers (*The commonest anti-thyroid drug used*).

Dose:

10 mg tds (maximum dose 60 mg/d) till euthyroid state is reached then decrease the dose to 5 mg T.D.S for 12 - 18 months.

If thyroxin 0.1 mg/day with anti-thyroid drugs → less danger of producing iatrogenic hypothyroidism or an increase in the size of the gland.

- 3- **Propylthiouracil:**

It blocks iodine binding to tyrosine and prevents peripheral conversion of T₄ to the more active T₃.

important preoperative preparation

- toxic goitre
- int. obstruction
- Pyloric "
- obstructive jaundice
- Shock → resuscitation
- elective ~~at~~ colonic surgery

4- **Potassium perchlorate:** It inhibits iodide trapping by the thyroid.

■ **Advantages:** Avoiding surgical risks and the possible hazards of radioactive materials.

■ **Disadvantages:**

- 1) There is no way to predict which patient is liable to pass into remission.
- 2) High relapse rate: 60% within 2 years from stopping treatment.
- 3) Further enlargement of the gland may occur.

4) **Adverse effects of the drugs:**

- Thyouracil & Carbimazol may cause gastrointestinal upset, rashes & arthralgia.
- Reversible bone marrow depression leading to agranulocytosis. Blood picture should be performed every two weeks.

B- Radioactive iodine:

■ **Aim:** It destroys the thyroid cells thus reducing the mass of functioning thyroid tissue.

■ **Dose:** 160 uCi per 1 gm of thyroid tissue. Improvement occurs by 8 - 12 weeks, if not a second dose may be required.

■ **Indications:**

- 1- Diffuse toxic goitre (above 25 y. old).
- 2- Thyrocardiac patients.
- 3- Refusal of surgery.
- 4- Recurrence after surgery.

■ **Contraindication:**

- a- Below the age of 25 years.
- b- During pregnancy & lactation.
- c- Huge goiter, retrosternal goitre and suspicious of malignancy.

■ **Advantage:** Avoidance of surgery and prolonged medical therapy.

■ **Disadvantage:**

- Thyroid insufficiency in up to 75 - 80% of cases after 10 years and so an indefinite follow - up is mandatory.
- It is also inadequate for the treatment of secondary toxic goitre.

C- Surgery:

■ **Aim:** Surgery cures by reducing the mass of overactive tissues or removing all the overactive tissues in case of toxic nodule.

■ **Indications of surgery are:**

- 1) Secondary toxic goitre.
- 2) Severe primary thyrotoxicosis.
- 3) Retrosternal toxic goitre, huge goitre or suspicious of malignancy.
- 4) Failure of medical treatment.
- 5) Occurrence of side effects due to medical treatment.

■ **Contraindications:** Young patient, mild cases or recurrence after surgery.

■ **Advantage:** A rapid cure with a high rate of success.

■ **Disadvantage:**

- a- Morbidity and mortality (negligible in experienced hands).
- b- Recurrence rate less than 5%.
- c- Thyroid insufficiency at an incidence of 20-45%.

■ Preoperative preparation:

1- Routine Method:

Medical treatment:

- Neomercazole is given till the euthyroid state is reached then surgery is performed.
- Some surgeons add Lugol's iodine 10 - 14 days immediately prior to surgery to decrease the vascularity and friability of the gland.

2- Rapid preparation: By β -adrenergic blocker.

- The action of thyroid hormones especially on the C.V.S. is proved to be through activation of adrenaline.
- Therefore inderal (propranolol) is now used for rapid control of C.V. manifestations before the operation.
- It acts on target organs and not on the thyroid itself.
- So, it must be continued for one week after surgery.

■ Operation: The following precautions should be considered:

- 1- Pethidine and hyoscine are given before anesthesia (atropine is not used as it causes tachycardia).
- 2- The incision should be wide with division of pretracheal muscles, thus manipulation is minimal to avoid thyrotoxic crisis.
- 3- The operation done is Sub Total Thyroidectomy by which the main mass of the gland is removed leaving only a thin posteromedial wedge of each lobe to maintain an euthyroid state, preserve the parathyroids and protect the R.L.N. The amount of the gland left is 4-5 gm on each side.
- 4- Perfect hemostasis and free drainage to avoid thyrotoxic crisis.

Special problems in management:

Thyrotoxicosis with pregnancy:

- Radioiodine is absolutely contraindicated because destruction of the fetal thyroid may result.
- Antithyroid drugs at usual doses would result in fetal hypothyroidism with the development of goitre that may obstruct the airway. Minimum dose antithyroid drug, preferably β - blockers, reduces this risk.
- Surgery after a short course of antithyroid drugs and propranolol proved to be safe during the second trimester.

Thyrotoxicosis in children:

- Radioiodine is contraindicated for children.
- Surgery is followed by a high recurrence rate due to high activity of the cells in the young.
- It is preferable to treat them by antithyroid drugs until the late teens.

The thyrocardiac patient:

- Thyroidectomy is ideal after control of the cardiac status.
- In unfit patients: radioiodine is used with antithyroid drugs until the effect of the former appears (6 weeks).

Proptosis of recent onset:

- It is not preferable to terminate the toxic status abruptly by surgery or radioiodine for fear of the risk of malignant exophthalmos.
- Antithyroid drugs are used until the proptosis has been stable for 6 months after which thyroidectomy is permissible.

سؤال مهم شفوی

Development of Thyroid Gland

[2]

Thyroglossal duct $\xrightarrow{\text{يسال}}$ Thyroid follicle

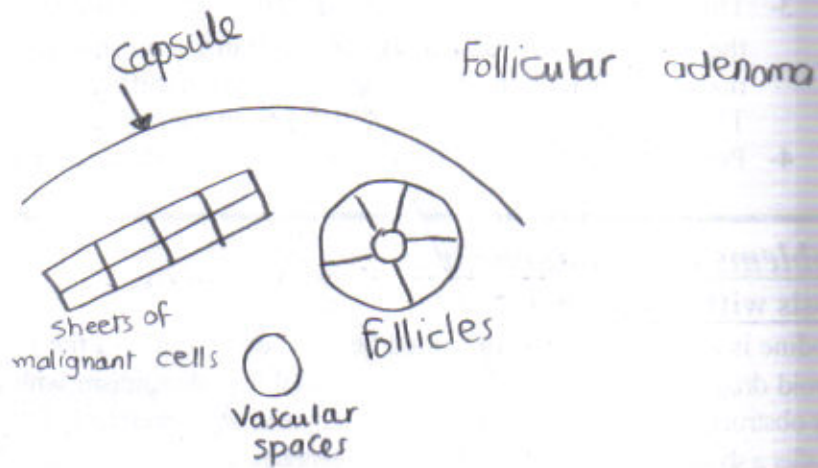
Neural Crest $\xrightarrow{\text{تفرع}}$ parafollicular cells

Calcitonin



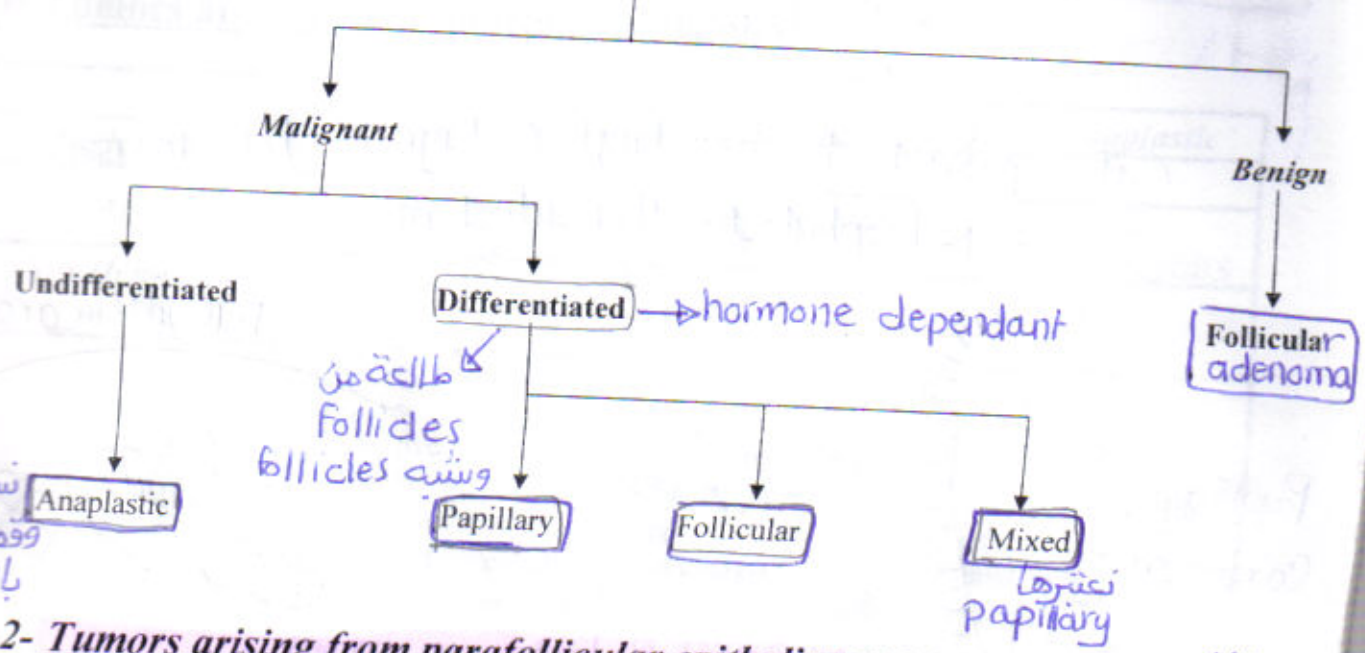
produced from parafollicular cells

action: $\downarrow \downarrow \text{Ca}^{++}$ Level in blood $\neq$ parathormone



Tumors Of The Thyroid Gland

1- Tumors arising from follicular epithelium:



- 2- Tumors arising from parafollicular epithelium: Medullary carcinoma. 6%
- 3- Tumors arising from lymphoid elements: Malignant lymphoma 4%
- 4- Rarely the thyroid gland is infiltrated by metastatic deposits or by local infiltration from a nearby lesion.

Follicular Adenoma

- Presents as a solitary nodule.
- Fine needle aspiration is not reliable to differentiate it from carcinoma as the main differentiating point in presence of histological evidence of capsular or vascular invasion.

Treatment:

- Lobectomy plus isthmectomy.

(Many authors now consider any papillary adenoma as carcinoma).

Papillary growth is malignant

Malignant Neoplasms

Incidence: More in females.

Predisposing factors:

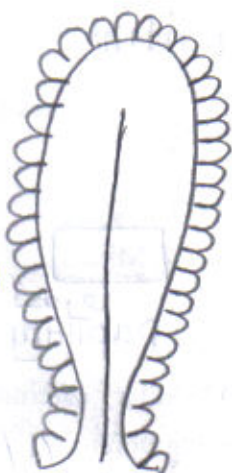
- 1- External irradiation of the head and neck region in children: was previously used for treatment of hemangiomas and thymic gland enlargement.
- 2- Simple nodular goitre 3%.
- 3- Follicular carcinoma is the commonest type to develop in endemic goitrous areas due to continuous stimulation by TSH.

عيان medullary Carcinoma يجيب مصيبة لأهلها
نحجب نجل Level Calcitonin relatives

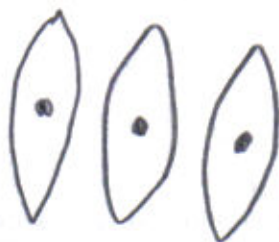
ل
معا مرة
وحالة

if proved to be high (stage of hyperplasia)
→ Prophylactic thyroidectomy

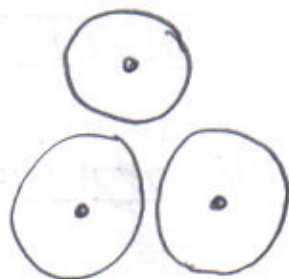
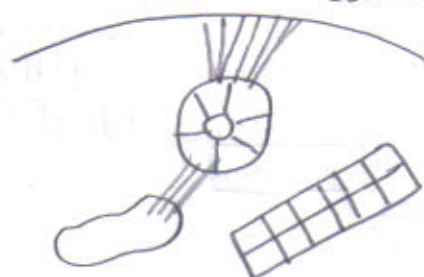
Papillary Carcinoma



Psammoma bodies



Follicular Carcinoma



Benign pheochromocytoma
medullary Carcinoma

× لوقيت

أعلاج pheochromocytoma

Attack hypertension
under anaesthesia

multiplicity

multicentricity

→ intrathyroid lymphatic spread

- 4- Genetic: the lesion is more common in certain families. Hereditary factor is marked in medullary carcinoma.
- 5- Malignant lymphoma may occur on top of Hashimoto's disease.
- 6- Anaplastic cancer thyroid may occur DE NOVO.

lymphoma 1/2
medullary 1/7
باقی 1/1

Pathology:

1- Tumors arising from follicular epithelium

	1- Papillary	2- Follicular	3- Anaplastic
Incidence	60%	17%	13%
Age	May occur in children and young adults	Middle age 40-60 years	Elderly >70 years
Sex (female: male)	3.5: 1	2: 1	1: 1.3
Microscopic picture	- Papillary projections composed of a stalk of connective tissue covered by a single layer of epithelial cells - Laminated calcified bodies (Psammoma bodies) are often present in the stroma.	- Thyroid follicles with a variable degree of differentiation. - Solid sheets may be present. - Diagnosis depends upon finding capsular or vascular invasion or the presence of metastases.	It may take the form of spindle cell, small cell or giant cell types
Multiplicity	Multiple foci may be present in the same or the other lobe in up to 80% of cases. These are due to either multicentricity or intrathyroidal lymphatic spread.	Rarely seen.	
Spread	Mainly by lymphatics.	Mainly by blood stream	Early direct lymphatic or blood
Mortality	Sq. cell 11% تقریباً 11%	24%	Most of the patients die within 1-2 years

N.B.:

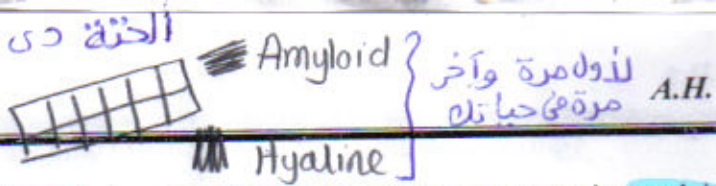
If the tumor contains both papillary and follicular elements it is considered papillary

most of cases are inoperable

2- Tumors arising from parafollicular cells: (Medullary carcinoma)

6%)

- The tumor may occur alone, or it may be associated with hyperparathyroidism and pheochromocytoma constituting (MEN IIa).
- The tumor may be familial and in this case, it is more common in children and young adults.
- It secretes calcitonin (Tumor marker).



- **Microscopically:** Sheets of neoplastic cells in a hyaline stroma, which may contain amyloid material.
- **Spread:** Lymphatic or blood.
- There is diarrhea in 30% of cases.

MEN (multiple endocrinal neoplasia) syndrome

1- Type I (Werner's syndrome):

- Parathyroid. Hyperplasia
- Pancreatic islets. islet cell tumors
- Pituitary tumor.

2- Type II (Sipple's syndrome):

- **Type IIa:**
 - Parathyroid.
 - Pheochromocytoma.
 - Medullary Carcinoma (thyroid).
- **Type IIb:** IIa + neurological abnormalities, multiple neuromas and marfanoid features.

3- Lymphoma: See lymphoma.

Clinical Picture: May be history of irradiation.

A) Early or Suspicious presentations:

- 1- If on top of pre-existing goitre:
 - a. Faster growth rate.
 - b. Harder consistency.
- 2- If a lump appears de novo: The rule is that any single thyroid nodule (especially in young males) is considered malignant until proved otherwise, especially if rapidly growing, hard, irregular and ill defined, considering that carcinoma can occur at any age from 15 to over 60y.
- 3- Rarely, the patient presents with metastases while the primary is impalpable. This occurs particularly in papillary type and the patient presents with enlarged deep cervical nodes. In the past, before knowing the nature of such nodes they were called *lateral aberrant thyroid*.

B) Late (sure) presentations: Goitre with spread:

1- Local spread:

- a. **Hoarseness of voice** (infiltrated RLN). However, laryngitis, tracheitis and RLN damage by past fever or previous thyroid surgery should be excluded.
- b. **Pain radiating to ear** (infiltrated vagal thyroid branches). However hemorrhage or infection in a nodule should be excluded.
- c. **Dysphagia** (infiltrated esophagus). Rarely it occurs in retrosternal simple goitre.
- d. **Severe dyspnea** (infiltrated trachea).
- e. **Fixity to skin** (sliding and pinching test).

- f. **Fixity to sternomastoid** (pinching the muscle away during swallowing)
- g. **Fixity to larynx and trachea** (lost vertical thyroid mobility).
- h. Surrounding carotid sheath, biding carotid pulse instead of pushing it backwards (**Berry's sign**).

2- **Lymph node metastasis:** Mainly in prelaryngeal, pretracheal and lower/deep cervical nodes. First lymph node affected in thyroid carcinoma is RLN then pretracheal and prelaryngeal (Delphic).

3- **Blood metastasis:** → **Fleshy Pulsatile** ←
 a. To lungs: Pain, cough, dyspnea, hemoptysis, crepitations & effusion.
 b. To bones: Painful, tender, pulsatile lump or pathological fractures. (Common sites are spine, skull & neck of femur).

N.B.:

Medullary carcinoma produces diarrhea in 30% of cases due to production of 5-hydroxytryptamine or prostaglandins **Serotonin**

D.D:

Other causes of goitre especially hard nodules e.g. Tense cyst, calcified nodule & Reidel's thyroiditis.

Investigations:

A) Laboratory Test: (For Tumor markers)

- 1- **Serum levels of thyroglobulin:** It is elevated in carcinoma as well as other types of goitres. It is only useful for following patients after total thyroidectomy to detect metastasis or recurrence in differentiated carcinoma.
- 2- **Detection of serum calcitonin:** elevation in medullary carcinoma.

B) Radiological:

- 1- **Thyroid scanning** (of limited diagnostic significance). Malignant lesion usually appears as cold areas in the scan, but it should be remembered that many benign lesions as cysts or hemorrhage in a cyst or degenerative nodules or thyroiditis appear also as cold areas.
- 2- **Ultrasound examination:** can prove whether the lesion is cystic, solid or cystic with solid projection.
- 3- **C.T. & M.R.I.** → **Thyroid** → **Local spread**

C) Aspiration of cyst:

A benign cyst is characterized by:

- a. The aspirate is clear.
- b. Complete disappearance of the cyst.
- c. No reaccumulation of fluid.
- d. Cytological examination is free.

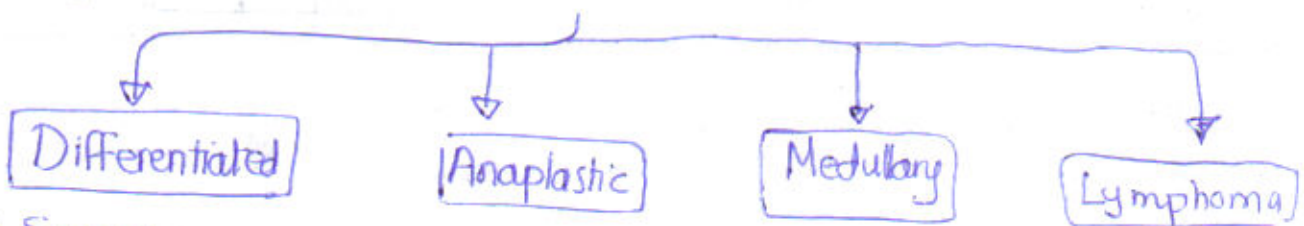
A cystic malignant lesion is suspected when:

- a. The aspirate is hemorrhagic.
- b. A residual lump is present.
- c. Rapid reaccumulation of fluid in the cyst.
- d. Cytological examination may be positive for malignant cells.

Hormone dependant tumors:

1-Breast carcinoma

2- Differentiated thyroid Carcinoma



① Surgery

• Thyroid

Total thyroidectomy

• LN

• Lobectomy
• Prognosis
• Inoperability
• Relapse

② L-thyroxine

→ replacement

→ Suppress T.S.H

0.3

0.1-0.2 (G.L.I.)

differentiated hcs

L-Thyroxine not short of toxicity

③ Metastasis

removal of deep Cervical L.N.s

radical

block neck

dissection

Selective

نسيج

• internal Jugular
• Sternomastoid
• Spinal accessory
• Submandibular

نسيج

D) Biopsy:**1- Fine needle aspiration cytology (FNAC).**

- An experienced pathologist can give accurate results in 90% of cases.
- This is a simple, fast, inexpensive investigation, which depends upon cytological examination of nodules 0.5 cm or more.
- ~~False positive results occur in 2% while false negative results occur in 3% of cases.~~
- In follicular carcinoma, FNAC may not be conclusive as the diagnosis of this lesion depends upon demonstration of capsular or blood vessel invasion.

2- **True cut needle biopsy:** It can get actual core of tissue for histological examination of nodules 2 cm or more in diameter. It may cause hematoma.

3- **Pre-operative L.N. biopsy** may be done from an enlarged cervical node.

4- **Frozen section** examination during open operation.

5- **Excision biopsy (hemithyroidectomy).**

6- **Incision biopsy is absolutely contraindicated** as it results in seedling of malignant cells.

E- Investigations to detect spread:

- 1- Chest X-ray to detect pulmonary deposits.
- 2- Laryngoscopy to check the mobility of the vocal cords.

Treatment:**I- Differentiated carcinoma:****• Surgical treatment:**

In operable and if possible in inoperable cases (as palliation) either **total thyroidectomy** or **lobectomy plus isthmectomy**.

• Surgeons who perform total thyroidectomy favor this procedure because:

- i. There is a high incidence of **multicentric lesions** in papillary carcinoma.
- ii. Total thyroidectomy ablates all thyroid tissue and makes it possible to **detect metastasis by scanning** and to treat them by radioactive iodine.
- iii. It is easy to **assess recurrence** by serum **thyroglobin**.

• Surgeons who perform lobectomy and isthmectomy favor this procedure because:

- i. No statistical difference was shown between the **results** of the two procedures.
- ii. Total thyroidectomy has a high incidence of **post-operative hypoparathyroidism**.

• Management of lymph node metastases: (only in operable cases):

- i. If there are no metastatic deposits: no need for prophylactic dissection.
- ii. If metastatic deposits are few: **selective removal** of these lymph nodes.
- iii. If metastatic deposits are extensive: selective block dissection is performed in which the spinal accessory nerve, internal jugular vein & sternomastoid muscle are preserved.

IV. In advanced cases: radical block neck dissection may be indicated

• **Postoperatively L-thyroxin:** 0.1-0.2 mg/day is prescribed to **suppress TSH** production, as most differentiated carcinomas are TSH dependent.

• Management of blood borne metastasis:

- Thyroxin is stopped for few weeks or substituted by tri-iodothyronine (to raise TSH) and then iodine scan is performed.

قانون

Criteria of Inoperability

- Extensive Local spread
Fixed to Structure ^{مستقر في البنية}

- Extensive Lymphatic spread

- Blood spread

- unfit for surgery →
 - لو أدت به خضه عظم بموت
ولو سببت لموت
 - أسيبه أحسن
بموت بعيد عني

- If there is evidence of local recurrence or metastases, a therapeutic dose of radioactive iodine is prescribed. *palliation*

II- Treatment of medullary carcinoma:

This tumor does not concentrate radioactive iodine and is not under the control of TSH.

Treatment is by total thyroidectomy and resection of metastatic lymph nodes. *+replacement*

III- Treatment of anaplastic carcinoma:

- The majority of these patients are inoperable when first seen.
- Rarely the lesion is operable and an attempt at cure by total thyroidectomy,
- The usual treatment is external irradiation and chemotherapy. If there is tracheal compression, resection of the isthmus is performed

IV- Treatment of lymphoma:

- 1- Radiotherapy & chemotherapy.
- 2- Surgery only:
 - a. To establish the diagnosis.
 - b. Relieve a compressed airway. *(isthmectomy)*

N.B.

Features of inoperability:

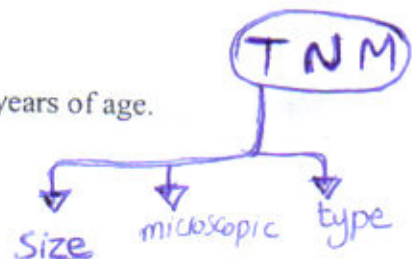
- 1- Infiltration of vital structures as carotids, trachea, bone etc. *Extensive Local Spread*
- 2- Blood spread.
- 3- Adherent L.N. to vital structures. *Extensive Lymphatic spread*
- 4- Unfit patient

N.B. 5- Anaplastic carcinoma is usually inoperable.

Prognosis of differentiated thyroid carcinoma:

Certain factors increase the risk including:

- ① Age of the patient: Males above 40 and females above 50 years of age.
- ② Sex: Females has better prognosis.
- ③ Size of the lesion: If more than 5 cm in diameter.
- ④ Presence of capsular or blood vessel invasion.
- ⑤ Presence of distant metastases.
- ⑥ Histological type.
- ⑦ Presence of LN. affection.



عقد جرابي Solitary Thyroid Nodule

Definition:

A goitre, which on clinical examination appears to be a single nodule in an otherwise normal gland.

Incidence:

More common in females and the commonest site is at the junction of the isthmus with the lateral lobe.

Etiology: Considered malignant until proved otherwise

- 1- Simple nodular goitre with one palpable nodule (*the commonest*).
- 2- Toxic nodule.
- 3- Colloid nodule.
- 4- Adenoma.
- 5- Malignant nodule.
- 6- Inflammatory nodule (thyroiditis).

Clinical picture:

- 1- **Malignant manifestations** (In case of malignant nodules)

How to suspect malignancy in a solitary nodule?

Considered

- 1- History of previous irradiation.
- 2- Young & elderly patients.
- 3- Recent onset & rapid growth.
- 4- Pain.
- 5- If the nodule is hard, irregular, with limited mobility.
- 6- Presence of local invasion, lymphatic or blood born metastases.

- 2- **Toxic manifestations:** (In case of toxic nodules).

- 3- **Cases which are not Frankly malignant or toxic: The case may be:**

- a. Early malignant nodule.
- b. Early toxic
- c. Simple nodule
- d. Adenoma.
- e. Inflammatory nodules.

In these cases, investigations are essential to diagnose the case.

Investigations:

- 1- **Thyroid scan:**

- a. May reveal the presence of multinodular goitre.
- b. If the nodule is hot, it is toxic and the possibility of malignancy is nearly excluded.
- c. If the nodule is warm, it is a functioning adenoma and the possibility of malignancy is only 3.5%.
- d. If the nodule is cold, the possibility of malignancy is 10-16%.

- 2- **Ultrasound.**

- 3- **Biopsy (see carcinoma).**

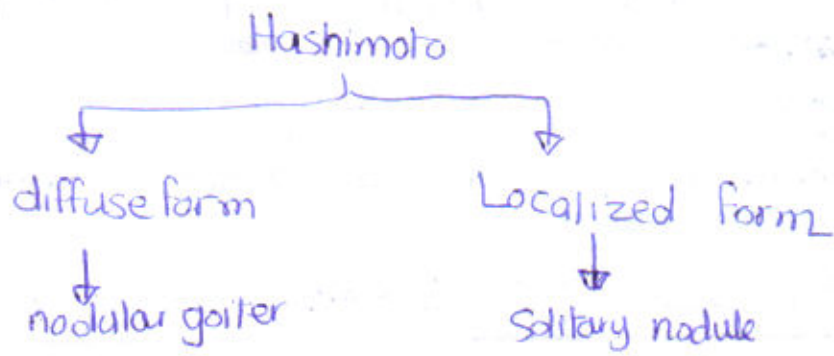
- 4- **Aspiration.**

- 5- **Thyroid function test:** Not routine.

- 6- **Investigation of carcinoma:** Not routine.

Treatment: Depend on the cause:

- 1- Malignant nodule: see before.
- 2- Toxic nodule: see before.
- 3- Cases which are not frankly malignant or toxic:
Hemithyroidectomy and histological examination i.e. excision biopsy.
 - a- If not malignant → nothing more is needed.
 - b- If malignant → see treatment of thyroid carcinoma.



ThyroiditisI- Acute Thyroiditis:

- The thyroid gland is rarely involved by bacterial infection.
- **Clinical picture:** Sudden onset of severe neck pain with dysphagia, fever.
- **Treatment:** antimicrobial drugs, however, surgical drainage of suppuration may be required.

II- Subacute Thyroiditis: (Granulomatous thyroiditis, De Quervain Thyroiditis)

- **Etiology:** Most probably a viral infection.
- **Clinical picture:**
 - Usually follows an upper respiratory infection. The thyroid becomes congested, swollen, firm, irregular & slightly tender.
 - Pain with fever.
- **Investigations:**
 - Elevation of ESR with a normal or depressed leucocytic count.
 - Iodine-uptake by the gland is depressed in the presence of a slight elevation of serum T_4 .
- **Treatment:** oral prednisone & anti-inflammatory may be used.

III- Chronic Thyroiditis due to tuberculosis or syphilis is rare.

Autoimmune thyroiditis
(Hashimoto's Thyroiditis)

Incidence:

- The most common form of thyroiditis.
- Usually affects females at menopause

Pathologically:

There is infiltration of the thyroid gland by lymphocytes and plasma cells.

Clinical picture:

- **Onset:** Insidious and asymptomatic or sudden and painful in others.
- The goitre usually lobulated, diffuse or localized to one lobe, soft or firm.
- Mild hyperthyroidism may be present initially but hypothyroidism is inevitable.

Investigation:

- 1- Serum titers of antimicrosomal and anti-thyroglobulin antibodies are elevated + Antimicrosomal
- 2- Biopsy.

Treatment:

- Full replacement dosage of thyroxine.
- **Surgical treatment:**
 - Indications:
 - Large-sized goitres.
 - Suspected development of papillary carcinoma, lymphoma or both.

أي واحد من thyroid ٤-٥ مئين

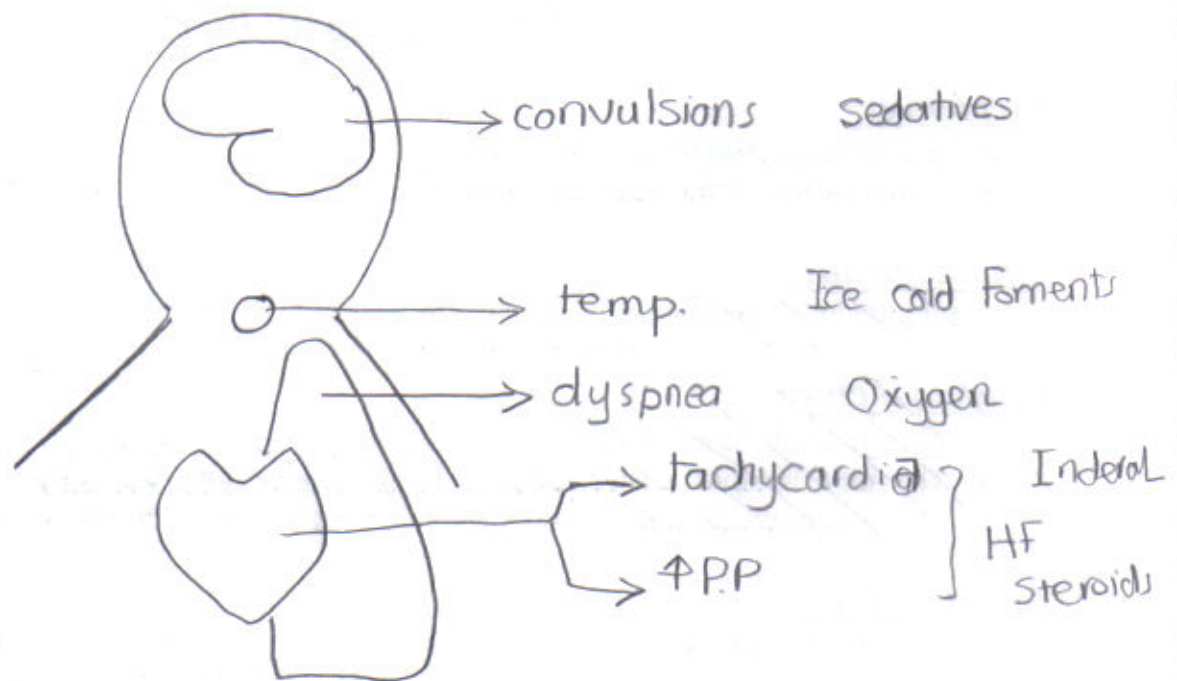
- ليه تشيل isthmus في كل حالات thyroid

عشان recurrence ← will present area

- ايه الفرق بين Lobectomy و Hemithyroidectomy

الاشيل تشيل ال Lobe و isthmus

في ال Lobectomy ← medial part of opposite Lobe.



Riedel's Thyroiditis شغوی مهم

- 0.5% of goitres.
- The thyroid is **hard** due to extensive fibrosis, which extends even beyond the gland.
- It is probably a **collagen disease**.
- ~~Hypothyroidism is usually present.~~
- The differentiation from anaplastic carcinoma may need an **open biopsy** where a wedge of the isthmus is removed to free the trachea.

Biopsy
→ relieve obstruction

Thyroidectomy

Indications:

1- Unilateral lobectomy:

- All solitary nodules.
- Multinodular disease in one lobe only.

2- Subtotal thyroidectomy:

- Diffuse toxic goitre.
- Bilateral toxic multinodular goitre.
- Bilateral simple multinodular goitre.

3- Total thyroidectomy: Papillary, follicular & medullary carcinoma.

4- Isthmectomy:

- Anaplastic carcinoma & lymphoma to free airway & obtain tissue diagnosis.
- Riedel's thyroiditis.
- Nodule in the isthmus.

Complications after thyroidectomy: مهم جدا جراحی نظری و شغوی

Apart from general surgical complications (shock, hemorrhage, infection, pulmonary complications and deep vein thrombosis).

1- Post-operative thyroid crisis (Storm):

This is a condition of "acute hyperthyroidism"

- **Incidence:** Rare nowadays due to the good preparation & control of toxicity before operation.
- It can occur during the course of the disease excited by severe nervous disturbance or a minor operation e.g. extraction of a tooth or incision of an abscess.
- More commonly it occurs after subtotal thyroidectomy. It usually starts within the 1st few hours to 48 hours after the operation.

○ Manifestations:

- 1) Hyperpyrexia: Temperature may rise to 41 °C or more.
- 2) Rapidly rising pulse rate: 160 or more, may be irregular.
- 3) B.P. rises greatly, systolic & diastolic (e.g. 250/120). The pulse pressure is high, so heart failure may occur.
- 4) Muscular excitability up to convulsion.
- 5) Dyspnea due to lack of O₂ as the metabolic rate is greatly increased.

میل حقیقت بیتر

- **Fate:** The condition, if severe, and if left untreated, death occurs in short time.

- 4 in size
 - لونها أصفر
 - may be embedded in thyroid
- لوانيت نفسك شلت Parathyroid مكان في الغدة

Autotransplantation في muscles of forearm

لونها

1- سهولة

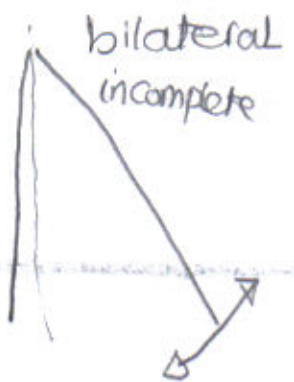
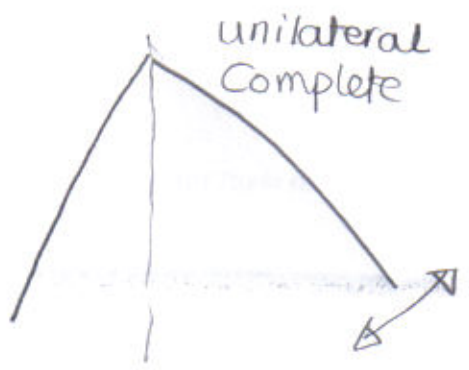
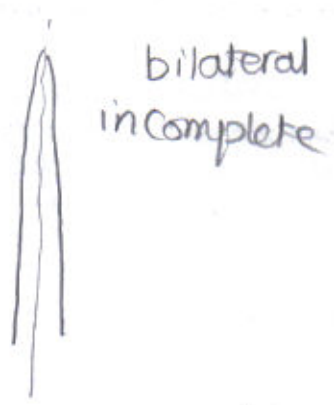
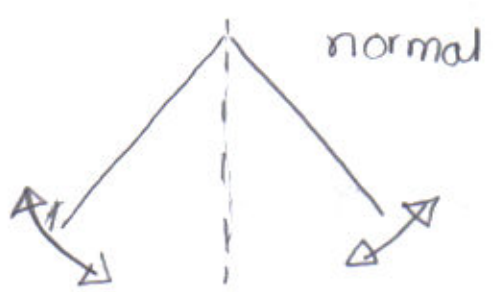
Antecubital vein من اقتران عينة دم

Parathormone

سؤال شفوي

1st symptom ايه Hypoparathyroidism

personality changes ←



○ **Treatment:** Should be urgent:

- 1) Ice packs to the limbs, head & abdomen. In severe cases the whole patient may be immersed in cold water or ice.
- 2) Morphia for sedation.
- 3) O₂ inhalation is essential, I.V. hydrocortisone (25mg).
- 4) β -adrenergic blockers (Inderal): I.V. drip until the pulse drops to about normal should be given carefully under ECG control.

2- **Reactionary hemorrhage:**

Results from continuous venous ooze following bad hemostasis. This hemorrhage is serious because it collects under deep fascia, compressing trachea. Suffocation may occur.

Management:

- 1) Immediate reopening of the wound.
- 2) Then transferring patient to theatre to explore the operation field under anesthesia and ligate bleeders.

3- **Dyspnea:** May be due to

- 1) Reactionary hemorrhage.
- 2) Bilateral incomplete RLN injury = Spasm of both cords = Severe dyspnea = Urgent tracheostomy (immediately after extubation).
- 3) Laryngeal edema from rough intubation (= tracheostomy).
- 4) Tracheal collapse from tracheomalacia (= tracheostomy).
- 5) Thyrotoxic heart failure (propranolol - digitalis).

4- **Change of voice:**

- 1) Hoarseness = Unilateral RLN injury.
- 2) Aphonia = Bilateral complete RLN injury.
- 3) Loss of high-pitched voice = External laryngeal nerve injury.
- 4) Tracheitis and laryngitis may cause temporary change in voice.

صوته العالي فيه مشكلة
صوته العالي عادي
Huskiness
صوت الحمار
الاسطوانة بناغت زمان لا نيجي نشغلها عمل الصوت ده لا نيجي تشتغل في الاول

5- **Injury of nerves related to thyroid:**

• **Effects of RLN injury: (on voice and respiration).**

- 1- Unilateral complete injury (paralysis of one cord) = Hoarseness + Dyspnea on exertion.
- 2- Unilateral incomplete injury (spasm of one cord) = hoarseness + Dyspnea on exertion.
- 3- Bilateral incomplete injury (spasm of both cords) = Stridor + Aphonia.
- 4- Bilateral complete injury (paralysis of both cords) = Aphonia + Dyspnea on exertion.

- 3% of people have RLN p paralysis (without operation) may be due to viral infection → neuritis. So do preoperative laryngoscopy (medico-legal).

6- **Tracheitis and laryngitis** = Temporary change of voice + dyspnea

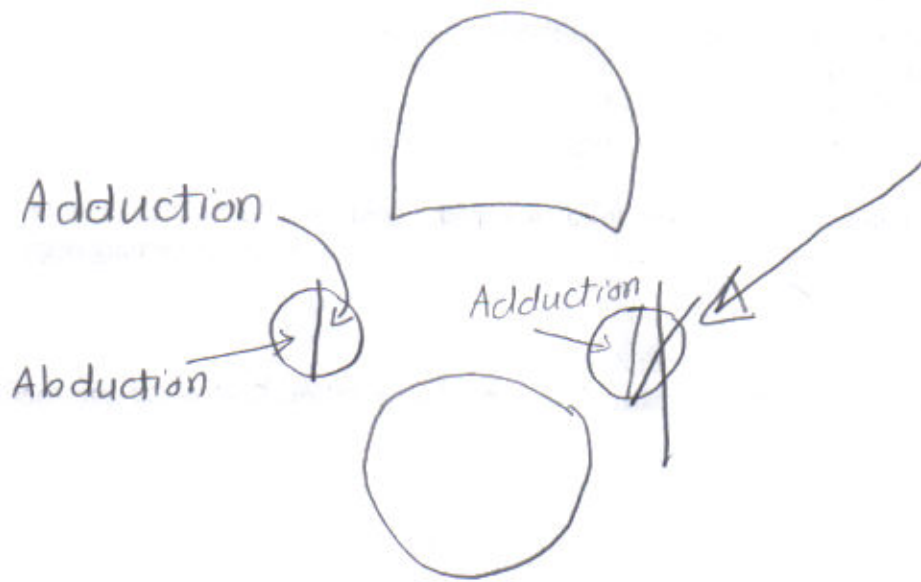
7- **Surgical emphysema** = Tracheal injury = Immediate suturing.

Inf. thyroid artery واذقة

تنخبط بخيط اسود
prolene
→ nerve repair
→ vascular

8- **Hypoparathyroidism:**

- Rarely occurs if all parathyroid are removed, or their vessels injured. Cramps (tetany) start few days after operation.
- **Emergency treatment:** 20 ml of 10% calcium gluconate IV slowly.
- **Maintenance treatment:** Ca + Vit D.



9- Progressive exophthalmos:Management:

- 1) Thyroxin to inhibit pituitary. → E.P.S. مبنية على النظرية القديمة
- 2) Preventing progression by sleeping semi-sitting and cortisone.
- 3) The eye is protected by:
 - i. Tarsorrhaphy.
 - ii. Orbital decompression in malignant exophthalmos.

10- Hypothyroidism: If enough thyroid tissue is not left.

11- Recurrence: Of toxic or nodular goitre.

12- Keloid in the scar: Occurs in low wounds on sternum. It is avoided by placing the incision in the lower neck crease.

قلناها هنا لأن هنا منظرها باين قوى
ولأن sternum من الأماكن المشهورة ان يبيح فيها Keloid
لأن نعمل incision والراس Hyperextended



Neck

غريبي

Branchial cyst & fistula

Origin:

- In embryo, there are 5 grooves on each side of neck called branchial clefts (like fish gills).
- First cleft persists as external auditory meatus. Other 4 clefts disappear normally.
- Second cleft is the commonest to persist and produce 2 anomalies:
 - 1- **Branchial fistula:** if cleft persists from skin to pharynx.
 - 2- **Branchial cyst:** if mid-part of cleft is sequestered.

Fig. (17)



غريبي

Branchial cyst

Congenital but presents in childhood or later.

Site:

- Upper part of side of neck (below angle of mandible deep to upper 1/3 of sternomastoid protruding beneath its anterior border).
- On contracting sternomastoid, branchial cyst seems to bulge out

Characters:

- Usually starts after the age of 20 years.
- Moderate size (5 cm diameter), smooth, globular, tense cyst, well defined and opaque.

Lining: tubulodermoid

Squamous epithelium, surrounded by lymphoid tissue, which explains its frequent inflammation.

Content:

Mucus rich in cholesterol crystals (rectangular with notched corner).



Always connected to pharynx:

- 1- Usually by fibrous band passing between external and internal carotids to end high in lateral wall of pharynx behind tonsil. (Supratonsillar fossa of Rosenmuller).
- 2- Rarely by open duct.

Treatment:

Complete excision. Through transverse incision, cyst is dissected and its fibrous band followed between carotids to lateral wall of pharynx.

لجنة الموت

* Written :

كلما
محل المفاجآت

* Oral

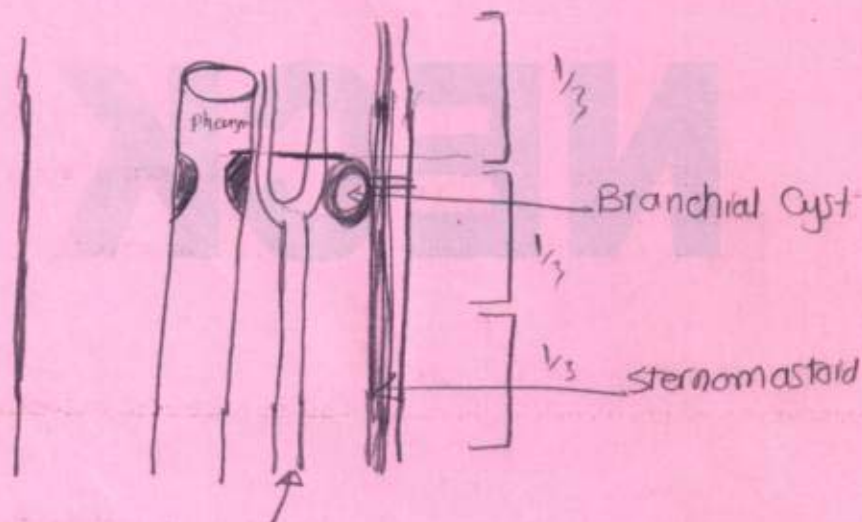
مش مصممة

* X-ray

cervical rib

* Operative, Jars, anatomy :

X



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Branchial fistula

A- Usually congenital: Present since birth.

Clinically:

- External opening lies on lower 1/3 of sternomastoid near its anterior border.
- It discharges mucus, and if infected pus.
- Fistula is felt as thread passing up and deeply through anterior part of sternomastoid.

Internal opening:

Fistula passes between external and internal carotids to end high in lateral wall of pharynx behind tonsil, usually blindly or rarely opening into it.

Lining:

Squamous epithelium, surrounded by lymphoid tissue, which explains its frequent inflammation (as pharynx).

D.D.: T.B. sinus.

+ Chronic osteomyelitis

Treatment:

- Complete excision.
- Transverse elliptical incision is made around external opening fistula is followed between carotids to lateral wall of pharynx.

طابق: شدة السجاجة وخش يا طيل ... لا أنا مش طيل

- Higher skin incision is added to facilitate dissection (*step-ladder incision*).
- A ureteric catheter may be introduced into the track to facilitate the operation.

B- Sometimes branchial fistula is acquired:

Thyroglossal

Due to rupture or incision of inflamed branchial cyst or incomplete removal of cyst

Clinically, it differs from congenital fistula in:

- **Age:** It appears in adulthood, on top of pre-existing cyst.
- **Site:** External opening lies high on side of neck (cyst level)
- **Treatment:** complete surgical excision.

من الأول أنا طيل ... شدة السجاجة وخش يا طيل

no need for step ladder incision

Cystic hygroma (Cavernous lymphangioma)

نظري

Not true tumor, but tumor-like congenital malformation (hamartoma) consisting of irregular lymph spaces, with no capsule.

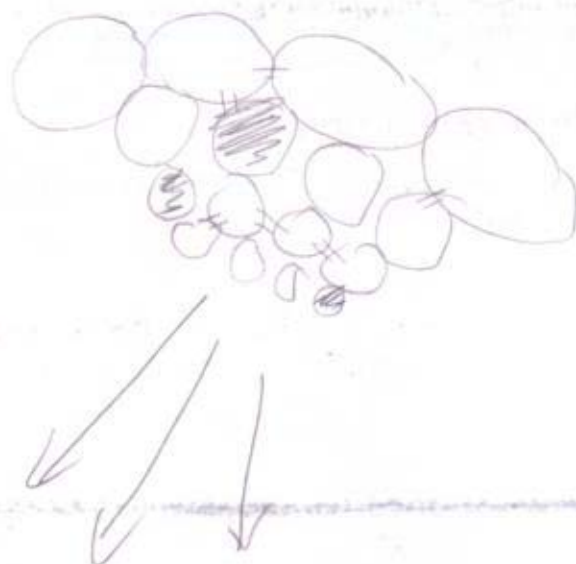
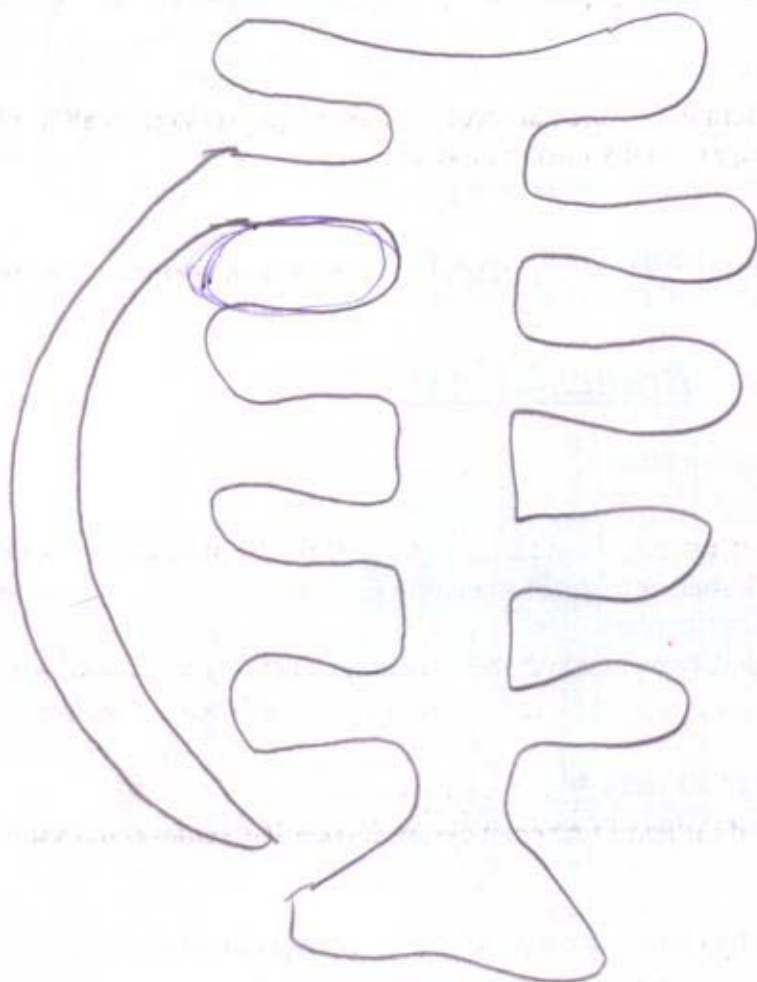
Origin: Sequestered part of jugular lymph sac of fetus.

Incidence: Rare: Appears at birth or shortly after.

Pathology:

It consists of multiple intercommunicating cystic spaces like soap bubbles. Cysts near surface are large while deeper ones small and infiltrate muscles. It is lined by endothelium and contains lymph.

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Clinically:

Commonest in lower part of side of neck, superficial to sternomastoid and extends to posterior triangle. It may enlarge upwards and reach ear. It is large, ill defined, irregular, lax, cystic, lobulated, translucent (All other neck swellings are opaque), partially compressible due to shift of lymph to deep cysts, and expands if child cries or coughs. It may contain solid areas due to clotting and fibrosis.

↳ Contract Sternomastoid

D.D.:

Other causes of cystic swelling in lateral side of the neck.

حول مذاكرة مش حاجان نلاحظ فيها

← AH حول

	Branchial cyst	Cystic hygroma
Origin	Sequestered part of branchial cleft.	Sequestered part of Jugular lymph sac.
Composition	Single cyst	Intercommunicating cysts.
Lining	Squamous epithelium	Endothelium
Content	Mucus + cholesterol crystals	Lymph
Age of onset	Child or adult	Infant
Site	High in neck, deep to sternomastoid	Low in neck, superficial to sternomastoid.
Shape	Globular	Irregular
Size	Moderate (5 cm diameter)	Large
Surface	Smooth	Lobulated
Consistency	Tense cystic	Lax cystic
Edge	Well-defined	Ill-defined
Transillumination	Opaque	Translucent

Other sites:

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Second common site is axilla, affected alone or with neck. Rare in cheek, lip (*macrocheilia*), tongue (*macroglossia*). Very rare in groin, mediastinum or pelvis.

Fate:

- 1- Usually continues to enlarge. In neck, this may cause suffocation.
- 2- Rarely spontaneous regression occurs after infection.

Treatment:

Excision as early as possible, Dissection may be facilitated by preliminary injection of boiling water or sclerosing material weekly for several weeks to induce fibrosis.

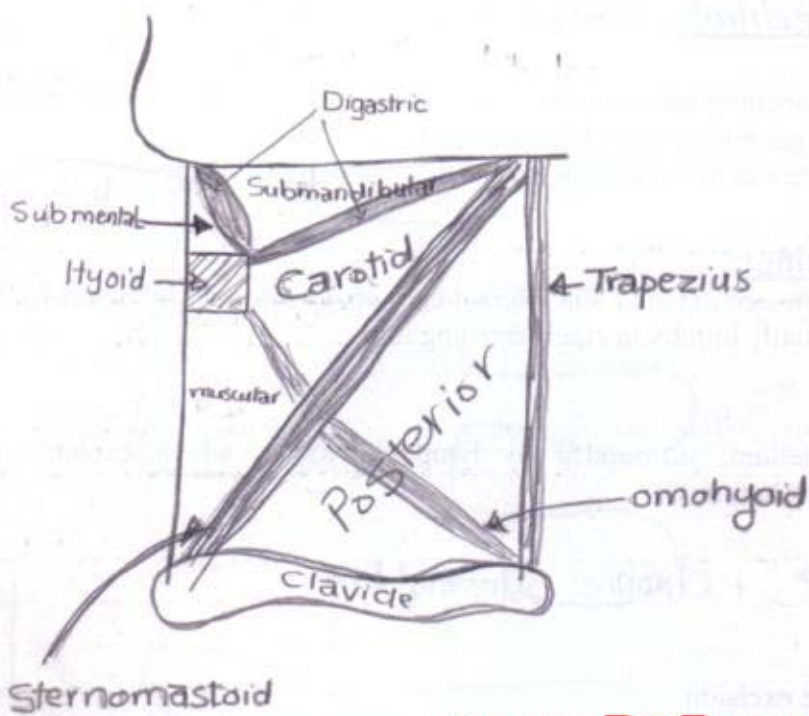
Sclerosing material دلوقة

Differential diagnosis of a mass in the neck

- X ■ The diagnosis of a mass in the neck depends upon the age of the patient, the clinical course of the mass, its consistency whether solid or cystic, and its site.
- It should be noted that the most common swellings of the neck are swellings of lymph nodes and thyroid, followed by those of the salivary glands. [مشرفي كل حصة]

Mid line swellings**■ Solid swellings:**

- 1) Submental lymph node enlargement.
- 2) Nodule in the isthmus of the thyroid gland.



Ant. & Post.
triangle

تقسم الneck

www.DrBacar.com

D.D. Swelling in Neck

في أي مكان

أول حاجة تفكر فيها

1- L.N

2- Thyroid

ولا تنس استكمال الشكل

■ Cystic swellings:

- LN 1) Cold abscess.
 2) Dermoid cyst: Sublingual or suprasternal.
 3) Subhyoid bursitis: It is a rare, tender, oval swelling which lies transversely beneath the hyoid bone. It moves up and down with deglutition and with protrusion of the tongue.
 4) Laryngocele: It occurs in musicians playing with air-blown instruments. It is a herniation of laryngeal mucosa through the thyrohyoid membrane. The swelling is resonant, compressible & increases in size with coughing or blowing.
 5) Cystadenoma of the thyroid isthmus.

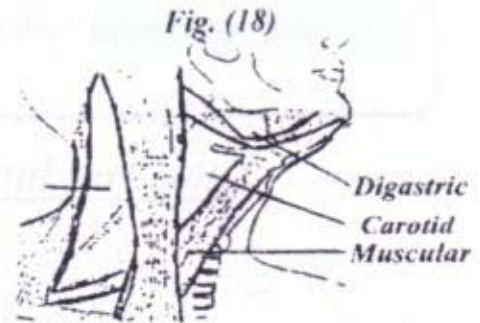


Fig. (18)
Triangles of the neck

Swellings in the digastric triangle

- 1) Enlarged submandibular lymph nodes: multiple, can be rolled over the edge of the mandible and can't be felt in the floor of the mouth.
- 2) Enlarged submandibular salivary gland.

Swellings in the carotid triangle

■ Solid swellings:

- 1) Enlarged upper deep cervical lymph nodes.
- 2) The upper part of an enlarged lateral lobe of the thyroid gland.
- 3) Carotid body tumor. It is a rare slowly growing malignant tumor arising from the chemoreceptors present at the bifurcation of the carotid artery. The swelling moves from side to side but not vertically. It may be pulsating.

■ Cystic swellings:

- 1) Cold abscess.
- 2) Branchial cyst.
- 3) Aneurysm of the carotid artery.
- 4) Cystadenoma in upper lobe thyroid

AB CC

Swellings in the posterior triangle

■ Solid swellings:

- 1) Enlarged lymph nodes.
- 2) Neurofibroma arising from the brachial plexus.
- 3) Cervical rib.

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■ Cystic swellings:

- 1) Cystic hygroma.
- 2) Pharyngeal pouch. = Zenker's diverticulum
- 3) Cold abscess.
- 4) Pneumatocele:

This is a cystic swelling in the supraclavicular region, which is resonant and compressible. It is due to herniation of the pleura in the base of the neck.

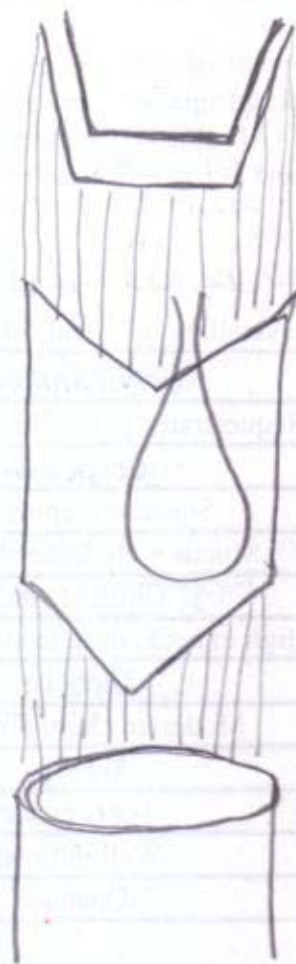
التنفس استكمال الشكل

In addition, it should be noted that swellings of the skin and subcutaneous tissue are common in the neck region and should be put in mind such as lipoma, sebaceous cysts, and hemangiomas, which are particularly common in the neck and face regions.



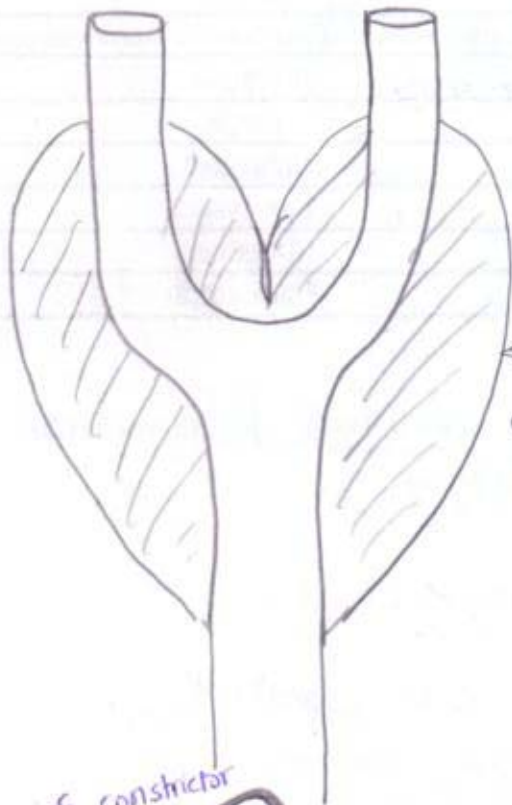
* Subhyoid bursa

- Cystic
- Oval & transverse axis
- tender
- moves



Laryngocele

Resonant
Reducible
Impulse on cough



قناة في
جبل

Resonant
Reducible
Impulse on cough

Sibson's fascia

Pneumatocele



inf. constrictor

Killian's Δ

Pharyngeal Pouch

etiology: Spasm in Cricopharyngeus

Pathology: herniation of mucosa through Killian Δ المنفذ القاني

C/P • Reducible + Resonant + in post. Δ
• dysphagia

tl division of spastic muscle + excision of diverticulum

Neck swellings with expansile impulse on cough & compressible: laryngocele, pharyngeal pouch & pneumatocele.



Sternomastoid tumor and congenital torticollis

Etiology

Abnormal development

Interruption of the blood supply to the central somite of sternomastoid muscle. This causes muscle infarction which becomes swollen, hence the name sternomastoid tumor. After a while the infarcted part will be replaced by fibrous tissue that will contract causing congenital torticollis.

Clinical features

- At birth (or shortly afterwards) there is a painless firm swelling at the middle of the sternomastoid muscle.
- Later when torticollis develops the head will be tilted to the side of the lesion with the face looking to the opposite side.
- If the condition is neglected it leads to facial asymmetry.

Differential diagnosis from 'wry neck' which is fibrositis causing spasm of the sternomastoid muscle. This condition is temporary lasting for a day or two and responds to anti-inflammatory drugs.

Treatment

- **Early after birth.** Attempt to prevent the development of the deformity by stretching and splinting of the neck may be done.
- **Established deformity.** Division of the sternomastoid at its lower part is done.



Neck injuries

Etiology: Blunt & Penetrating trauma.

Pathology

- Blunt trauma usually causes fracture of the spine and only in severe injuries it may be associated with visceral and vessel injuries.
- Penetrating injuries deep to the platysma are usually associated with injury to viscera and vessels.

Complications:

1. Fracture of the cervical spine can lead to quadriplegia or paraplegia.
2. Injury to the larynx can lead to respiratory obstruction, aphonia or hoarseness of voice. Laryngeal stenosis may be a late complication.
3. Arterial injury leads to hemorrhage which may be severe enough to cause shock. It may also lead to interruption of the blood supply to the brain causing infarction and a neurological deficit.
4. A vein injury in addition to hemorrhage can lead to air embolism.
5. Injury to the esophagus will be followed by leakage and severe infection in the neck which may extend to the mediastinum.

Clinical features of complicationsInvestigations

Plain x-ray and angiography are very useful to detect fractures and vessel injury. However, in cases with severe bleeding, immediate exploration is necessary.

Treatment

Life-saving measures: primary and secondary surveys.

Definitive treatment:

- Visceral and vascular injuries. Exploration and repair.
- Treatment of spinal injuries

XX

Cellulites of the neckSuperficial cellulitesDeep cellulites (Ludwig's angina)☐ Pathology

- It is a clinical condition characterized by inflammatory swelling of both the submandibular region and the mouth cavity
- Infection is deep to the deep fascia and can spread to the glottis causing edema and asphyxia

☐ Clinical features

- Painful, red, warm, tender submandibular swelling
- The overlying skin is edematous

☐ Treatment

- Antibiotics and drainage through an incision beneath the jaw

مضاعفات

Thoracic outlet syndrome

The brachial plexus and the subclavian artery pass to the upper limb through a narrow triangle in the base of the neck. This triangle is made up of the scalenus anterior muscle anteriorly, the scalenus medius muscle posteriorly and, the first rib inferiorly. At this narrow space compression of the nerves and the artery may occur.

www.DrBacar.comEtiology:

- Cervical rib which may be complete or incomplete. This bony structure extends from the 7th cervical vertebra to the first rib.
- A fibrous band extending from an incomplete cervical rib and ending at the first rib.
- A tight scalene muscle.
- X ■ Post fixation of the brachial plexus. In this case the lower root of the brachial plexus arises from T₁ instead of T₇, thus this nerve becomes excessively bent over the first rib.

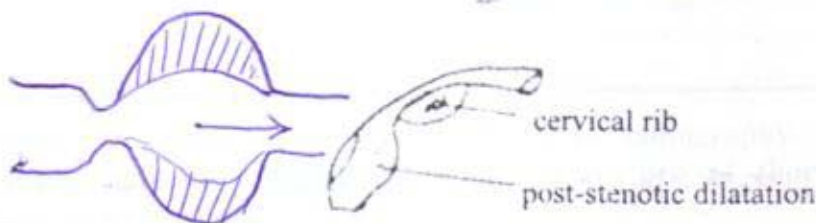
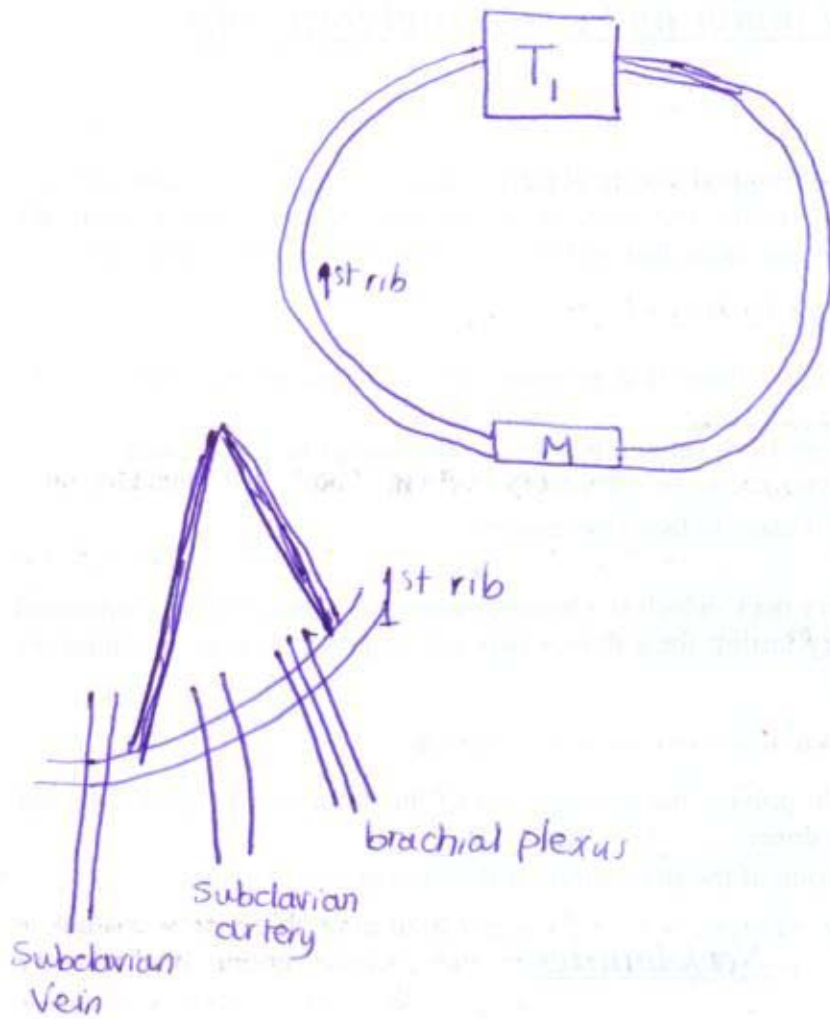


Fig. (19)

Post-stenotic dilatation of the subclavian artery

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Complications:

Post-stenotic dilatation:

- It is an aneurysmal dilatation, which may send a shower of emboli to the index ~~and middle~~ ^(Radialis indices) fingers, as they are the direct continuation of the brachial artery.

Clinical picture:

■ Incidence:

- More commonly in females. About 20 years.
- Usually unilateral affecting the right arm (dominant arm).

■ Symptoms:

- 1) Vascular: Intermittent claudication.
- 2) Vasomotor: Raynaud's phenomenon due to irritation of the sympathetic fibers.
- 3) Nervous: Tingling and numbness in the medial aspect of the forearm and the hand.

Bone: swelling in post Δ in neck

■ Signs:

- 1) A bony swelling at the base of the posterior triangle (the bony cervical rib).
- 2) Hyposthesia and wasting of hand muscles may be noticed.
- 3) **Adson's test:** The patient is asked to extend his head, look to the opposite side and take a deep breath. The examiner then palpates the radial pulse while the arm is pulled down. If the test is positive, the pulse will be weaker. *This test is not very accurate.*

Differential diagnosis:

- Spondylosis and carpal tunnel syndrome. ^{Nerve}
- Other causes of Raynaud's phenomenon. ^{Artery}
- other causes of post Δ bone

Investigations:

- Plain X-ray to the neck may detect a bony cervical rib. ^{bone}
- Nerve conduction study ^{between the neck and the forearm to detect delay in conduction. This is a useful investigation and can differentiate between thoracic outlet syndrome and carpal tunnel syndrome.} ^{Nerve}
- Subclavian angiography. ^{Artery}

Treatment:

- 1) No Symptoms. Not treatment.
- 2) Physiotherapy to strengthen the shoulder muscles ^{التمهيد الزرق}
- 3) Surgery; the following operations.
 - a- Excision of a bony cervical rib. The rib should be excised with its periosteum.
 - b- Incision of the scalenus anterior muscle (scaleneotomy)
 - c- Excision of the first rib to relieve the compression inferiorly (*very efficient*)

N.B. In many persons a cervical rib is detected by radiography, yet it is asymptomatic. Also in many patients who have the clinical picture of thoracic outlet syndrome, radiography does not reveal a cervical rib.



Radical block neck dissection

Definition

Removal of all lymph nodes on one side of the neck, in one mass (en bloc)

Indications

Operable primary malignancy of the head or neck, with palpable malignant cervical lymph node (the main indication)

Prophylactic radical block neck dissection i.e. where cervical nodes are impalpable e.g. melanoma and carcinoma of the tongue.

Technical considerations

Incisions the operation can be done through different incisions, the goblet incision is a popular one

Structure that are removed in radical block neck dissection

- ☐ All lymph nodes on one side of the neck
- ☐ Other structures are also removed because of their close proximity to the cervical nodes
 - Sternomastoid muscle.
 - Carotid sheath.
 - Internal jugular vein.
 - Submandibular salivary gland.
 - Lower part of the parotid gland.

Varations of radical block neck dissection

- ☐ *Suprahyoid block dissection*: it is restricted to the lymph nodes above the level of the hyoid bone
- ☐ *Modified radical block dissection*: similar to radical block neck dissection but with preservation of the internal jugular vein, sternomastoid and spinal accessory nerve.



Pharyngeal diverticulum (pharyngeal pouch)

A protrusion of mucous membrane through the Killian's dehiscence (pulsion diverticulum) due to raised intrapharyngeal pressure, from failure of relaxation of the cricopharyngeus (achalasia) during contraction of the pharyngeal muscles above it, in the act of swallowing. Once formed, the protrusion fills with food at every meal, and progressively, increases in size displacing the esophageal opening. The pouch descends towards the mediastinum, but often turns outwards, usually to the left to appear in the posterior triangle of the neck.

Clinical features

- The patient is usually an elderly, and the condition is twice as common in men as in women.
- It may give rise to symptoms identical to those of a foreign body in the throat.
- In long-standing cases there is history of dysphagia, recently aggravated and associated with regurgitation of undigested food after meals, eructation of gas and a gurgling noise in the neck.
- Sometimes, there is an irritable cough from overflow of food into the larynx.
- In about one-third of cases, the pouch is large enough to form a visible swelling in the neck, which enlarges when the patient drinks and can be emptied by pressure.
- In advanced cases, progressive loss of weight occurs and may lead to cachexia.

Diagnosis

- Barium swallow may show a bulge in the posterior wall of the pharynx in early cases, but in late cases there is a flask shaped pouch sometimes with a fluid level.
- Esophagoscopy is not recommended as it may perforate the fundus of the pouch.
- Manometric studies may be helpful.

Treatment

When the pouch is of a large size, surgery is recommended. The diverticulum is excised, its neck closed in two layers and a cricopharyngeal myotomy is performed.

The breast

* Theoretical: «written»

اک

- Acute lactational mastitis.
- Nipple discharge.
- Carcinoma.

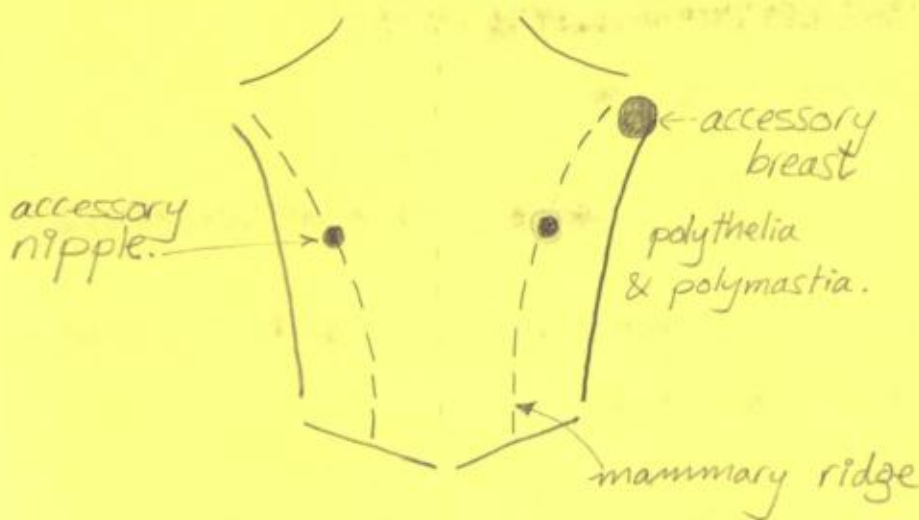
۳ موضوع

→ Fibroadenoma جہ مرقہ قبل کرا.

* Clinical: short Long.

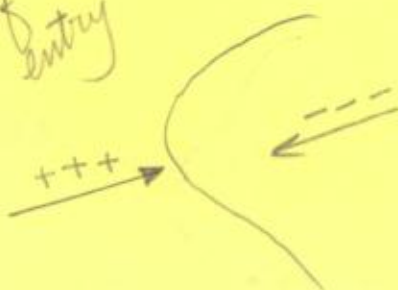
* Iars: female breast carcinoma کلہم
 male breast carcinoma واحدہ

* Operative: # of breast carcinoma, # of breast abscess.



تفرقہ من lipoma
 axilla
 →
 یکو مع اد
 puberty
 Breast functioning

Route of entry



Multilobular abscess.

مستوحدة في اي امتحان
عناوين فقط (للحياة)

The Breast Congenital Anomalies

عناوين مفهومة

~~Congenital anomalies of the breast may involve the nipple or the breast itself.~~

Anomalies of the nipple:

- 1- **Athelia:** Absence of the nipple is very rare and is usually associated with absence of the breast (Amazia).
- 2- **Polythelia:** Supernumerary nipples occur anywhere along either or both the mammary ridges (mammary lines) which extend from the axillae to the groins. An accessory nipple may be mistaken for a mole or a wart.

Anomalies of the breast:

Melanocytic → Haemangioma.

- 1- **Amazia:** Absence of the breast is usually unilateral and is often associated with absence of the sternal portion of the pectoralis major.
- 2- **Polymazia:** Supernumerary breasts are due to persistence of extramammary portions of the mammary ridges. They may occur in the axilla (accessory breast), groin, or even the thigh. They may function during lactation.

ليست
Anomaly

- 3- **Infantile gynecomastia:** Diffuse enlargement of the breast, which may be unilateral or bilateral. It is caused by the effect of circulating maternal sex hormones. The condition is usually reversible within 6 months, and, therefore requires no treatment.

tissue responsiveness

if squeezed if ♀

- 4- **Small breast (Micromazia):** Treatment: Augmentation mammoplasty.

- 5- **Diffuse Hypertrophy:** Treatment by reduction mammoplasty.

يمكن ما يظلمش
Breast
تاني

Inflammations of the breast (Mastitis)

Acute lactational mastitis & breast abscess

Operative - نظري

Incidence: acute mastitis is most common during lactation. because milk is excellent culture medium for infection.

Etiology:

[any abscess → staph]

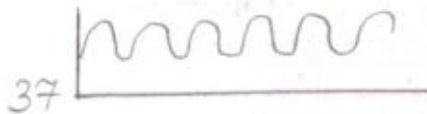
- **Organism:** Staphylococcus aureus: It induces clotting of milk in the ducts producing obstruction and stasis.
- **Route of entry:**
 - 1- Organisms from the mouth of the suckling infant gain access through nipple cracks and openings of lactiferous ducts.
 - 2- Much less common is the blood born infection.
- **Predisposing factors are:**
 - 1- Milk engorgement caused by inspissated milk and epithelial debris that block the ducts.
 - 2- Abrasions to the nipples.
 - 3- Poor hygiene.

Pathology:

- Infection is at first diffuse.
- The disease usually starts by milk engorgement, which if not properly treated will lead to acute mastitis.
- Staphylococci tend to produce necrosis and pus formation causing a **multilocular abscess**.

Cardinal symptoms & signs of pus formation:-

- 1- Fever hectic
- 2- Pain throbbing.
- 3- Pitting oedema.
- 4- Localization.
- 5- Fluctuation من ظاهرا
- 6- Pointing.



نَفْع - نَبْض
في مصر العيان يقول على
أي الم نفع
عشان كده بنمويه نبض

Where we don't wait for fluctuation?

But wait for pus formation

1. Breast. (soft) هو اميل
2. Parotid (due to parotid fascia).
3. Hand infection.
4. Perineal abscess.
5. Perinephric abscess.
6. Gluteal abscess.
7. Ear lobule.



<u>Inflammatory carcinoma</u> gradual onset & no low grade fever	<u>Acute bacterial mastitis</u> Acute onset & high fever.
Progress is slower	Rapid progress
Involves > 1/3 of breast Skin is dusky red	One breast sector is affected Skin is rosy or bright red
Mildly tender or non tender	Tender axillary nodes.
No response to antibiotics in 1 week is an indication for biopsy.	The lesion is either cured by antibiotics or forms an abscess.

Clinical Features:1- Stage of milk engorgement:

- a. **Pain:** Dull aching. «not severity but type of pain»
- b. **Fever:** Persistent pyrexia.
- c. **Examination reveals:** Enlargement and induration of the breast but there are no physical signs of inflammation.

2- Stage of acute mastitis:

- a. **Pain:** Gets worse.
- b. **Fever:** Continuous higher pyrexia.
- c. **Examination reveals:** Diffuse swelling, redness, induration and tenderness, *hotness*.

3- Stage of acute abscess: Suppuration is diagnosed if:

- a. **Pain:** Is throbbing.
- b. **Fever:** Hectic.
- c. **Examination reveals:**
 - Physical signs get localized in the breast.
 - Pitting edema is elicited in the area of the skin overlying the abscess.
 - Persistence of the local signs of inflammation for more than 5 days or severe systemic upset for more than 2 days after full antibiotic treatment.

Breast abscess is one of the sites where the surgeon should not wait for fluctuation to diagnose it

4- Stage of chronic breast abscess.

Differential Diagnosis: The most serious is acute mastitis carcinomatosa. *very aggressive carcinoma*

Investigations: Total leucocytic count will show leucocytosis.

Medicolegal.
عسان الناس ما تقولش راحت
تفتح الخراج جالها سوطا.

Treatment:1- Before the development of an abscess:

The condition can be medically treated:

- An **antibiotic** against staphylococci e.g. flucloxacillin, cephalosporin.
- **Support** of the breast helps to lessen pain. = *local rest*
- **Local heat.**
- **The advisability of weaning** is controversial, but a reasonable approach is to:
 - Advise cessation of breast-feeding if the baby has been nursed for more than 9 months. The agents in common use are bromocriptine (Parlodel) 2.5 mg twice daily or stillbesterol 10 mg three times / day.
 - If the baby is younger, the patient is asked to use the healthy breast for feeding and to regularly empty the inflamed breast by squeezing and by a breast pump. After resolution of infection the baby can be refeed by both sides.

واحدة ديليك
دادي هيكلها
(بدوي على غشيم)
ام سيد
(9 شهر)
اصبع قويا من ان
يجلس على الطليقة مع والدتي
وان ياكل ما يساهم
الاسواق

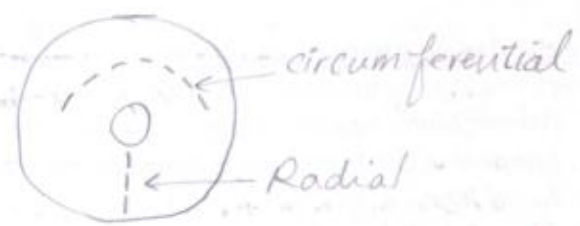
2- Abscess formation is treated by incision and drainage:

- **Anesthesia:** general. *اوعى تشدقها عظاما متخيل*
- **Incision:** A radial or more cosmetic circumferential over the most tender area to release the pus, which is sampled for culture and sensitivity. → *staph غالباً*
- The surgeon's finger **breaks down the septa** between the loculi to form a single cavity
- A **drain** is brought out through the wound or at the most dependant part of the breast through a **counter incision**.
- **Antibiotic** therapy may be continued for a few days. *[if abscess is properly incised → no need for antibiotics]*

Pubertal mastitis.



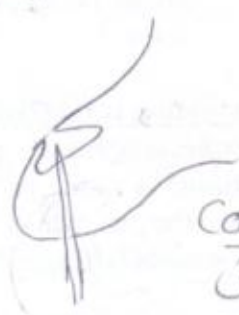
- Circumareolar incision
- Subcutaneous mastectomy



Drainag of breast abscess in acute lactational mastitis may lead to → milk fistula (esp. circumferential)

الحل الوحيد - wearing

direction of ducts.



Counter incision

الpus ما يطلعش في breast tissue

as any pathological lesion تطلع على السطح

e.g. carcinoma → fungate

Non-lactational mastitis

The commonest type of non-lactational mastitis is that which complicates mammary duct ectasia

Pubertal Mastitis *قراءة* *Gynecomastia* *انحسار*

- This condition affects adolescent boys leading to pain and swelling of the breast, which becomes indurated and slightly tender, but suppuration never occurs.
- The tenderness usually subsides in two years, but may persist for a prolonged period.

if not → indication for surgery → subcutaneous mastectomy (circumareolar incision)

Chronic Inflammatory Conditions of the Breast

1- Mammary duct ectasia (plasma cell mastitis).

2- Chronic breast abscess:

Etiology: Acute abscess, which was treated by, prolonged use of antibiotics or was drained by a small incision.

Clinical picture: See carcinoma.

Treatment: Treatment is excision not only simple incision.

3- Tuberculosis of the breast:

Clinical picture: see carcinoma. *simple*

Treatment: Is by antituberculous drugs. Mastectomy is indicated in patients with resistant infection.

Mammary Duct Ectasia *قراءة (مهمة الحياه)* *abnormal dilatation.* *not precancerous* *معجون اسنان*

- The disease is characterized by dilatation of the major ducts, which fill with creamy secretion.
- The etiology is unknown.
- Duct ectasia may be asymptomatic or may present by one of the following:
 - Nipple discharge:** blood stained, serous, creamy white or yellow.
 - Retraction of the nipple** due to shortening of the ducts.

3- Acute inflammation.

4- Recurrent and chronic inflammation: see breast carcinoma. *Chronic inflammatory mass - plasma cell mastitis.*

Treatment: *Bloody discharge + old age. Recurrent abscesses. Chronic inflammatory mass. worry the doctor or patient.*

Troublesome cases of duct ectasia are treated surgically by excision of the major ducts through a circumareolar incision. *major duct excision → cone excision*

if duct closed *partial* *intermittent complete* *gradual persistent complete* *Hypertrophy of gland but if sudden closure → atrophy of gland, no engorgement.*

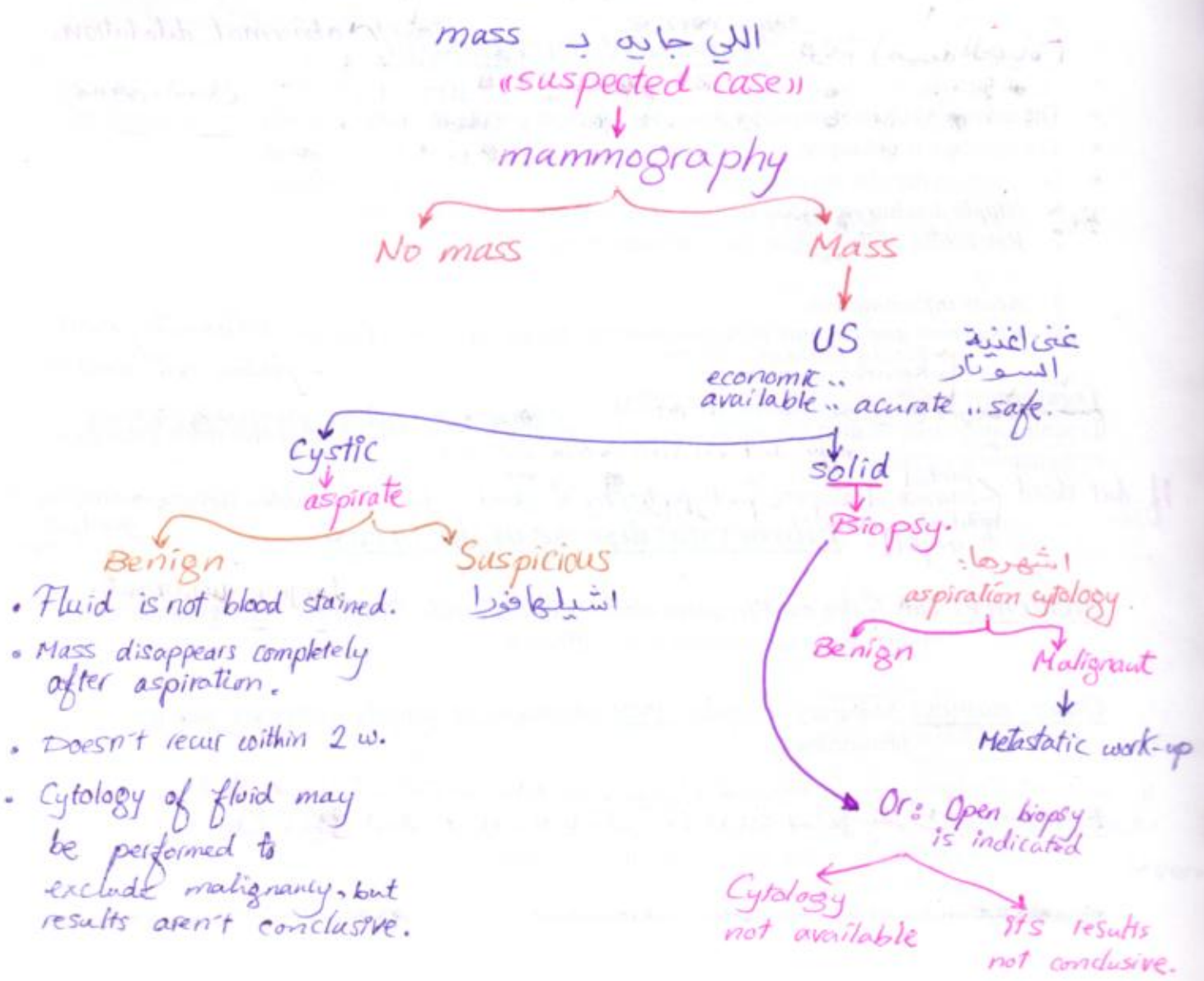
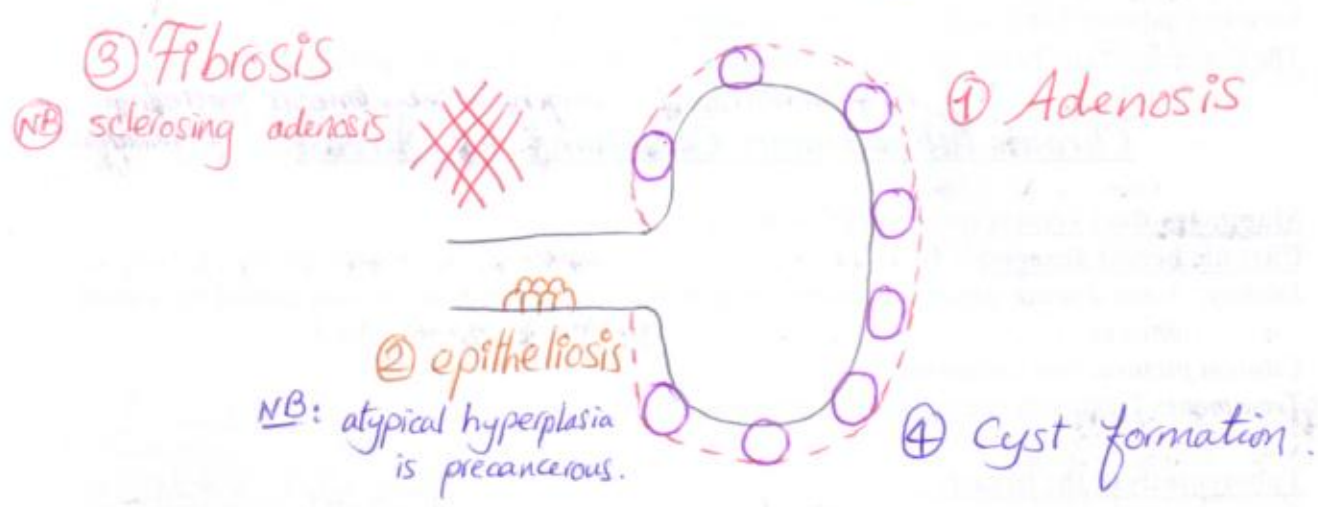
Fibrocystic disease of the breast

Incidence: This is the most frequent disorder of the breast. The *Largest quadrant.* *upper outer* quadrant of the breast is the commonest site of affection.

Other names: Mammary dysplasia, ANDI (aberrations of normal development and involution), fibroadenosis.

Etiology: *اربعى تقول لخبطة هرمونات .. اننى مش عيابة اصلا .. بعض ايه السبب؟؟* *حد بيخس على .. جليله ويقتل ايه السبب؟؟ ولا يا دكتور انا قلانة صراحي بتخبر؟؟*
The exact cause is not known, but the prevalence of the disorder in women aged 30-50 years and its rarity after the menopause suggests that it is related to ovarian activity.

Fibro cystic disease pathology



Pathology: All are not pathology except = cyst formation

Mixture of the following with a variable proportion:

- 1- **Adenosis:** Glandular hyperplasia- causing multiplication of acini.
- 2- **Epitheliosis:** Solid epithelial hyperplasia within small ducts. In rare cases there is "Atypical epithelial hyperplasia" which is accompanied by higher possibility of developing breast cancer.
- 3- **Fibrosis:** When fibrosis is extensive it clinically resembles schirrhous carcinoma, and is called "sclerosing adenosis".
- 4- **Cyst formation:**
 - **Structure:**
 - Lined with epithelium & are filled with clear yellow or sometimes brownish fluid.
 - Cyst may be large, distended with clear fluid and the cyst is now called (Blue NB doomed cyst of Bloodgood) clear fluid in thin walled cavity appear clear. (شفوي) (اصلا لونه Clear).
 - **Etiology:**
 - i. Abnormal involution of the supporting connective tissue in the lobules allows the acini to dilate.
 - ii. Obstruction of the ducts by papillomatosis and by the surrounding fibrosis.

Clinical Features:

- 1- May be asymptomatic.
- 2- **Accidentally felt lump.** This may be caused by a prominent cyst, aggregation of small cysts, or by the sclerosing adenosis.
- 3- The most frequent complaint is of multiple, sometimes painful, small lumps that may be unilateral or bilateral (painful nodularity). The lady usually observes this in relation to her cycles; on examination they are felt by **fingertips** not by flat of the hand. (so, if is not significant)
- 4- **Mastalgia (breast pain):** Usually cyclical. The pain typically occurs few days premenstrually and is accompanied by enlargement and increased nodularity of the breasts.
- 5- **Nipple discharge:** Is usually clear or yellow, but sometimes brown or green. (مش عارف ليه احضري ومشي عاين يعرف very ch.ch. → ANDI ايسلوش غير)

Differential Diagnosis: See later.

- 1- Other causes of breast mass.
- 2- Other causes breast cysts.
- 3- Other causes of mastalgia.

Investigations:

Investigations are usually not required, but the following are indicated to rule out breast cancer in suspected cases:

- 1- **Ultrasound** and **mammography** show the cysts.
- 2- A cyst is fully **aspirated**. It is considered benign if:
 - a. The fluid is not blood stained. (Red)
 - b. The mass disappears completely after aspiration. (No Residual mass)
 - c. Does not recur within two weeks. (Doesn't Recur)
 - d. **Cytology** of the fluid may be performed to exclude malignancy, but the results are not conclusive. (Cytology is good +ve but not good -ve).

- Biopsy** {
- 3- A solid mass is aspirated for cytology.
 - 4- Open biopsy is indicated if cytology is not available, or if its result is not conclusive.

Treatment:

Exclusion of malignancy and reassurance of the patient are the most important.

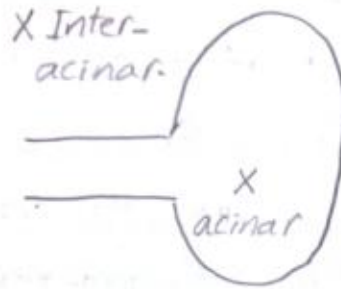
- **No symptoms:** No treatment.

Reassurance:-

* أوعي تقول لخبطة هرمونات، ولا احتمال نادر جداً جداً
يقلب سرطان .

* انتي عندك عرض من غير مرض .. زي الصراخ .. هو اللي عنده صراخ
مش لازم يكون عيان .. فانتي عندك صراخ في صدرك .
وعشان كده انتي علاجك مسكن .

تصر على اقوالك مهما حاولوا معاك



Cysts of the breast

- **Cysts:** Are treated by aspiration. A recurring cyst is excised for biopsy.
- **Cyclic mastalgia:**
 - In mild cases reassurance and wearing (night and day) a brassiere is usually enough.
 - Giving up caffeine consumption (coffee, tea and chocolate) may be useful.
 - Analgesics: NSAID's
 - Prolactin inhibitor as bromocriptine 2.5 mg b.d. gives good results in many patients.
 - Danazol, which is a synthetic androgen, is effective in controlling cyclic pain.

N.B. Cases with atypical epithelial hyperplasia need regular medical follow up.

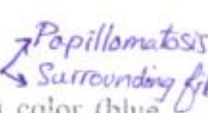
• لما ناخذ Biopsy لو عندها mass
• لو ما اكتشفناش مش بنزور
عليناها

Risk of cancer
breast is the same
in those having &
Not having ANDI.

Cysts of the breast

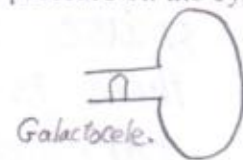
Classification

Acinar Cysts: (From the duct system)

- 1- **Retention cysts:** See fibroadenosis. *etiology: Obstruction of duct by*  *Popillomatosis*
 - Large cysts distended with clear fluid may have a curious blue green color (blue domed cyst of Bloodgood).
 - It represents more than 75% of breast cysts.

- 2- **Galactocoele (milk cyst):** Develops during or shortly after lactation from obstruction to one of the principal ducts. The cyst forms a solitary painless swelling situated close to the nipple; a little milky fluid may be expressed from the nipple by pressure on the cyst. *جاء مع سؤال ب 10 قر دور اول 1927*

- 3- **Intracystic papilliferous carcinoma.**



Inter-acinar cysts: (in the stroma)

Cysts arising in the stroma are rare and include:

- 1- Dermoid cyst.
 - 2- Lymph cyst.
 - 3- Blood cyst: arise either as traumatic hematoma or due to bleeding into a cyst.
 - 4- Hydatid cyst.
 - 5- Sebaceous cysts.
- سطحية في اي حته*

Treatment:

- 1- Aspiration: Mention criteria of benign and suspicious cyst.
- 2- Excision: Retention cysts, which recur after aspiration, and all other cysts should be excised.

- ① Fluid is not blood stained.
- ② Disappears completely after aspiration.
- ③ doesn't recur within 2 weeks.

Nipple discharge

Etiology:

- 1- **Physiological:** *لا تفسد*
 - a. Milk production with lactation.
 - b. Serous discharge during pregnancy.

للحياة لا
تكتسب في الامتحان

Serous discharge:

can be caused by carcinoma
& it is more common than bl. stained
discharge in carcinoma.

Differential pressure test:



- Apply pressure on different parts of areola around nipple & use magnifying lens to see if discharge from single or multiple ducts.

Duct galactography:-

- use a needle to inject lipidol & use X-ray imaging to see if there is duct papilloma or carcinoma (filling defect).



catheter - قسطر
Dye - صبغ
X-ray - أشعة

Treatment

Mass
excision &
Biopsy.

No mass

Bloody discharge

Discharge is not
bloody.

single duct

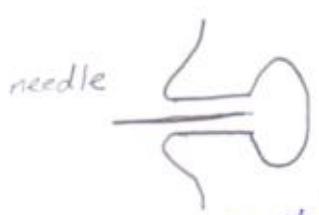
Multiple
ducts

Conservative

Microdochectomy

Conservative

- stoppage of discharge
- single, bloody Microdochectomy
- Mass excision
- Troublesome core excision. (= major duct excision)
- Other cases. continue conservative



① اعمل Duct galactography

② ادخل probe في الفتحة التي يتجيب discharge

③ افترق Radial incision واسفل ال Probe

بال fissures التي حواله

2- Pathological:

Cause	Nature of discharge
Duct ectasia (the commonest)	Serous, creamy white, yellow, blood stained, brown- green or black
Fibrocystic disease	Clear, yellow, brown or green
Duct papilloma	Blood or blood stained discharge from the duct
Duct carcinoma	(Rare) cause of blood or blood stained discharge from one duct
Contraceptive pills	Serous or milky discharge from multiple ducts
Hyperprolactinemia	Milky discharge (galactorrhea) from multiple ducts

Diagnosis:

History and examination should provide the following information:

- Nature of discharge. [Bloody - serous - -]
- Association with a mass.
- Unilateral or bilateral. Bilateral is common in benign cases
- Single duct or multiple duct discharge (Differential pressure test).
- The use of contraceptive pills.

ANDI
Hyperprolactinaemia

Investigations: من بين كسوي

- 1- Test for **occult blood** in the discharge if it is not apparent. → Look for (Hb)
- 2- **Cytology** of the discharge for exfoliated cancer cells.
- 3- Soft tissue **mammography**. If no mass detected → mass من صيكل سكة ال
- 4- **Duct galactography** in case of single duct discharge.
- 5- **Serum prolactin estimation** in suspected cases of galactorrhea.
- 6- **Ultrasound** to detect solid or cystic swelling.
- 7- **Biopsy** (if mass was detected with mammography or ultrasound).

Treatment:

- 1- A palpable mass should be excised for histology and treated accordingly.
- 2- A single duct bloody discharge calls for excision of this duct (**microdochectomy**). A needle with a blunt tip is introduced into the affected duct acts as a guide for the surgeon. This duct, with a rim of the surrounding tissues is excised and is sent for histological examination.
- 3- Discharge from multiple ducts with no palpable or mammographic mass is treated conservatively by observation. Rarely the discharge is persistent and troublesome where it is surgically treated by excision of the major ducts.

شعوي :-
لو فيه duct papilloma
ايه ال Mass
اللي تحسها يا؟
• Retention cyst «not papilloma».



Bloody discharge

Retention cyst

Hard fibroadenoma

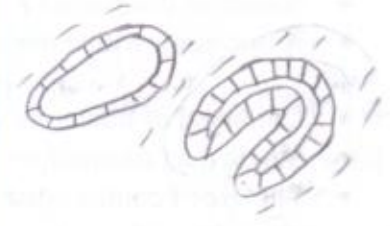


- Age: 20-30 yrs.
- More common
- Small rounded
- Firm (harder)
- freely mobile (breast mouse)



Whorly appearance

Soft fibroadenoma.



- 30-50 yrs
- Less common
- Large lobulated
- Firm (softer)
- Restricted mobility «Large size»
- No ch-ch cut section

Hard fibroadenoma



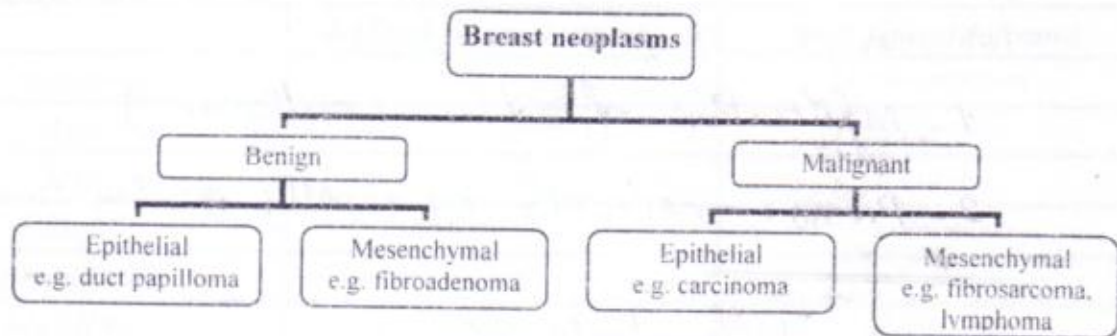
Bulge in cut section
• لانه مشحون ب Capsule
مخليه Rounded
فلما نقطعها نطلع به.

carcinoma



Retract in cut section
due to fibrous
tissue in schirrhous
carcinoma.

Breast neoplasms



قراءة Duct papilloma

- A duct papilloma is usually situated in one of the ^{major} main ducts near the nipple in a young woman.
- Clinically:
 - 1- Bloody or blood stained discharge (the commonest).
 - 2- Retention cyst: Behind the mass.
 - 3- ~~Palpable mass: Pressure on the mass may produce discharge.~~
- Ductography: Shows filling defect.
- Treatment: Is by excision of the affected duct (microdochectomy).

اي واحدة سنك مبرقحت (0.5) Fibroadenoma محتمل نظري جد مرة قيل كده وعندنا افكر فيه mass

Fibroadenoma is the commonest breast mass of young women. The usual age is between 15-30 years.

Pathology:

A fibroadenoma is a benign mixed neoplasm of the breast, which affects both the fibrous and the glandular tissues, but the fibrous element predominates.

Grossly:

- The tumor may be solitary or multiple, firm, with smooth surface that may be lobulated in big lesions. It is well circumscribed and is never attached to surrounding tissue.
- The cut surface reveals lobules of whirled white fibrous tissue, which bulges out of its capsule.

Histologically: There are two types:

- ~~Pericanalicular~~ (hard) fibroadenomata are the usual form. These tumors are formed mainly from fibrous tissue that surrounds a few small tubular glands. They tend to be small.
- ~~Intracanalicular~~ (soft) fibroadenomata contain more glands. They are usually larger and softer than the ~~pericanalicular~~ type.

Hard.

Clinical Features:

- Age: Hard fibroadenoma occurs commonly in young women 20-30 years of age while soft fibroadenoma occurs between the ages of 30-50.

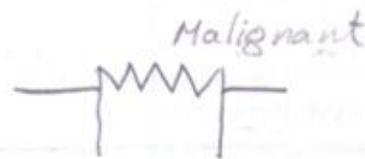
Oral:

what are the mechanisms of skin ulceration in neoplasm?

- 1- infiltration of skin (malignant)
- 2- Pressure necrosis by rapidly growing tumor (benign)

How to differentiate??

I pass a probe between mass & edge
if pass $\rightarrow$ benign.



Incidence & etiology of carcinoma of the breast
ARM

① Age

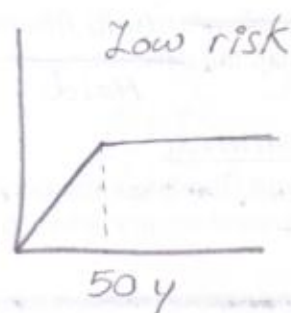
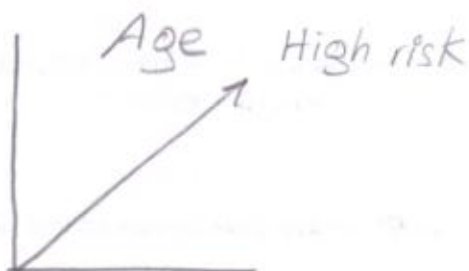
② Race

③ Menstruation

④ Past history $\left\{ \begin{array}{l} \text{Her} \rightarrow \text{breast carcinoma - precancerous lesion} \\ \text{Her family} \end{array} \right.$

⑤ Nullipara - late 1st pregnancy.

⑥ Obesity



- **Painless lump** accidentally discovered usually small (few centimeters), not tender, well circumscribed with smooth surface that may be lobulated with high mobility within the breast "**breast mouse**"

	Hard fibroadenoma	Soft fibroadenoma
Frequency	Commoner	Less common
Age	20-30 years	30-50 years
Size	Small	Large
Shape	Rounded	Lobulated
Consistency	Firm	Softer
Mobility	Free (breast mouse)	Restricted
Histology	See before	

Investigations: Soft tissue mammography reveals well-circumscribed lesion.

Treatment: Treatment is by **excision** and histological confirmation of the diagnosis.

Cystosarcoma Phylloides:

- **Pathology:** Highly cellular type of fibroadenoma that tends to grow rapidly [central part → degeneration]
- **The name:** It was so named by Brodie who used the term phylloides because the cut surface resembles a leaf.
 - The term Cystosarcoma however is a **misnomer** as many are not cystic and it is rarely malignant.
 - It is therefore better termed **Phylloides tumor**.
- A big tumor may cause skin ulceration. The tumor is not attached to the skin.
- **Treatment:** Is by wide local excision to prevent recurrence. If the tumor is **infiltrating** the whole breast, simple mastectomy is indicated **occupying**

Carcinoma of the breast

Introduction:

- The breast is the most common site of cancer in women.
- In the USA one in every nine women is expected to develop cancer in lifetime. **واحدة في كل دور**
- In Egypt it occurs at a younger age than in western countries and it accounts for about 35 % of the total malignancies among Egyptian females **representing the commonest malignant neoplasm in females.**

Incidence:

- **Race:** Black and Asian women are less affected. **americans more affected**
- **Age:** In **high-risk** population, the risk generally increases progressively with age. In low risk population, the risk increases and reaches a plateau at the age of 50. **العلاجية**

Etiology:

The exact etiology of breast cancer is not known. Genetic, endocrinal or environmental factors may have role.

- **Scirrhous carcinoma (NOS (not otherwise specified)) (about 70 % of carcinoma):**
 - 1- **The tumor is:** Hard. The cut surface is concave, rough, gritty and pale gray.
 - 2- **Microscopically:** All degrees of differentiation from anaplasia to well differentiated tumors with attempts at adenoid formation may occur.
 - 3- **Spread:** Early lymphatic spread.
- **Encephaloid carcinoma: (10% of carcinoma)**
 - 1- **The tumor is:** Large, soft and brain like.
 - 2- **Microscopically:** It contains less fibrous tissue than the common not otherwise specified type. The tumor shows lymphocytic infiltration.
 - 3- **Spread:** To lymph nodes occur later than the not otherwise specified carcinoma. The prognosis is better than the not otherwise specified variety.
- **Mucinous carcinoma: (3 % of carcinoma)**
 - 1- **The tumor has:** A gelatinous consistency and is usually bulky.
 - 2- **Microscopic picture:** Mucin is produced by the tumor cells and is present either intra or extra cellular. *any mucinous carcinoma → benign, except the solid type*
- **Inflammatory carcinoma (mastitis carcinomatosa):** *Breast react by inflammatory process*
Is a rare type, but is the most malignant. It is a fulminant form that resembles mastitis. *من التهاب*
- **Non-Infiltrating lobular carcinoma (0.7 %):** Frequently multicentric.
- **Infiltrating lobular carcinoma: (7.5 %)**
 - Grossly and microscopically the tumor is indistinguishable from scirrhous carcinoma and the diagnosis can be certain only when the preinvasive lobular nodule of a tumor can be identified histologically.
 - Bilateral in 25 % of cases.
- **Paget's disease of the nipple: (1 %)** *Non inf → infiltrating*
 - **Nature:** An intraduct carcinoma which begins in the epithelium of a main duct and spreads to the skin of the nipple and down into the breast substance.
 - When the nipple epithelium is infiltrated, it produces nipple erosion. In early stages a mass may not be palpable, a mass may only appear after 2 years from the start of the disease.
 - **Histologically:** there are:
 - 1- **Paget's cells:** Clear vacuolated cells, with small dark staining nuclei, which occur alone or in clusters in the deep layers of the epidermis.
 - 2- **Hyperplasia** of all layers of the epidermis.
 - 3- **Round cell infiltration** of the dermis. *6000*

Hormone receptors:

About 60% of breast cancers have receptors for estrogen & are termed ER-positive. These tumors are hormone dependant & respond more to hormonal treatment, Tumors may also have progesterone receptors.

Spread: *blood spread → axillary LN affection → Mass, Microscopic affection → axillary LN → Mass*

Previously it was thought that breast cancer spreads locally at first, then by lymphatics and lastly by the blood stream. This view is no longer accepted and is now well realized that carcinoma of the breast may spread by the blood stream very early producing micro-metastases in distant organs. *it was micrometastasis & can't be diagnosed*

- 1- **Local spread:** Can occur through the breast substance, overlying skin- underlying pectoralis major and serratus anterior muscles and the chest wall.

شفوي:
 احظر واحدة بحليها Breast carcinoma
 الي جالها قبل كده ← Breast carcinoma
 ← Duct papilloma ← precancerous

• Hormone & its relation to breast carcinoma

الستهود: شفتاه بيحفر حوالين مسج الجريمة بقاله اسبوع
 وطلع الاسانسير قبل وقع الجريمة ونزل بعدها.

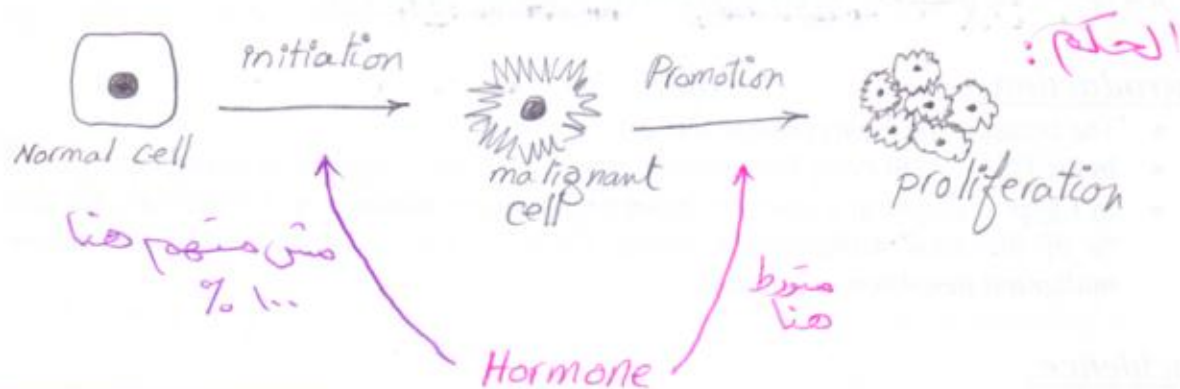
الدفاع: محدش قادر يحسك عليه دليل.

الادعاء:

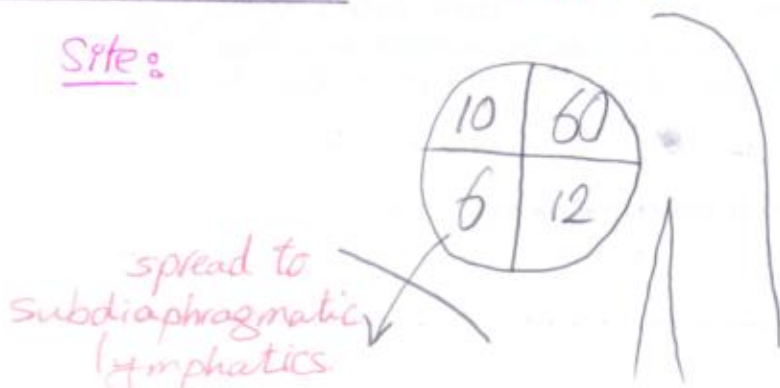
Hormonal tht. (Antiestrogen)

ودورها في علاج Breast carcinoma

وده دليل قاطع يا حضرات المستشارين ان الهرمون
 هو السبب.



Site:



• Genetic factors:

- العائلة
- It has been proved that in 5-10% of all cases of breast cancer, there is an autosomal inheritance of a mutant gene. Two genes BRCA1 & BRCA2 are incriminated. These cancers usually occur at a younger age & are multifocal & bilateral.
 - Presence of breast cancer in the mother or sister increases the risk by 2-3 times while presence of the disease in both the mother & sister increases the risk by 14 times.

• Endocrinal factors:

عائلة واحدة Cancer in the other breast.

- Atypical epithelial hyperplasia.
- Menstrual history: Early menarche (under 12 years), late menopause (after 50 years).
- Obesity & high intake of saturated fatty acids. Steroid hormones are converted to estradiol in fatty tissues.
- Pregnancy: late first pregnancy (after age of 30), nullipara.
- The relation to oral contraception is not exactly known.

• Precancerous lesions:

- Moderate or marked epithelial hyperplasia and duct Papilloma increase the risk by 1.5 - 2 times.
- Atypical epithelial hyperplasia increases the risk by 2 - 5 times.
- Lobular or ductal carcinoma in situ increases the risk by 5 - 10 times.

Site:

- من في كتاب الفسيولوجيا
- Inner, lower (6%) is the rarest & worst → spread to subdiaphragmatic lymphatics.
 - Upper, outer (60%) the commonest → largest volume of breast tissue.
 - Central part (12%) the 2nd common → spread to subareolar area from neighboring tissue.
 - Lower, outer (12%).
 - Upper, inner (10%).
- spread from all quadrants. ↩

Pathology:

There are the following pathological types:

• Carcinoma of the ducts:

1- Non-infiltrating (ductal carcinoma in situ): 6%.

- i. Comedocarcinoma.
- ii. Non-comedocarcinoma. (Papillary or solid).

2- Infiltrating ductal carcinoma:

- i. Schirrhous carcinoma 70-75%.
- ii. Encephaloid carcinoma 7%.
- iii. Mucinous carcinoma 3%.

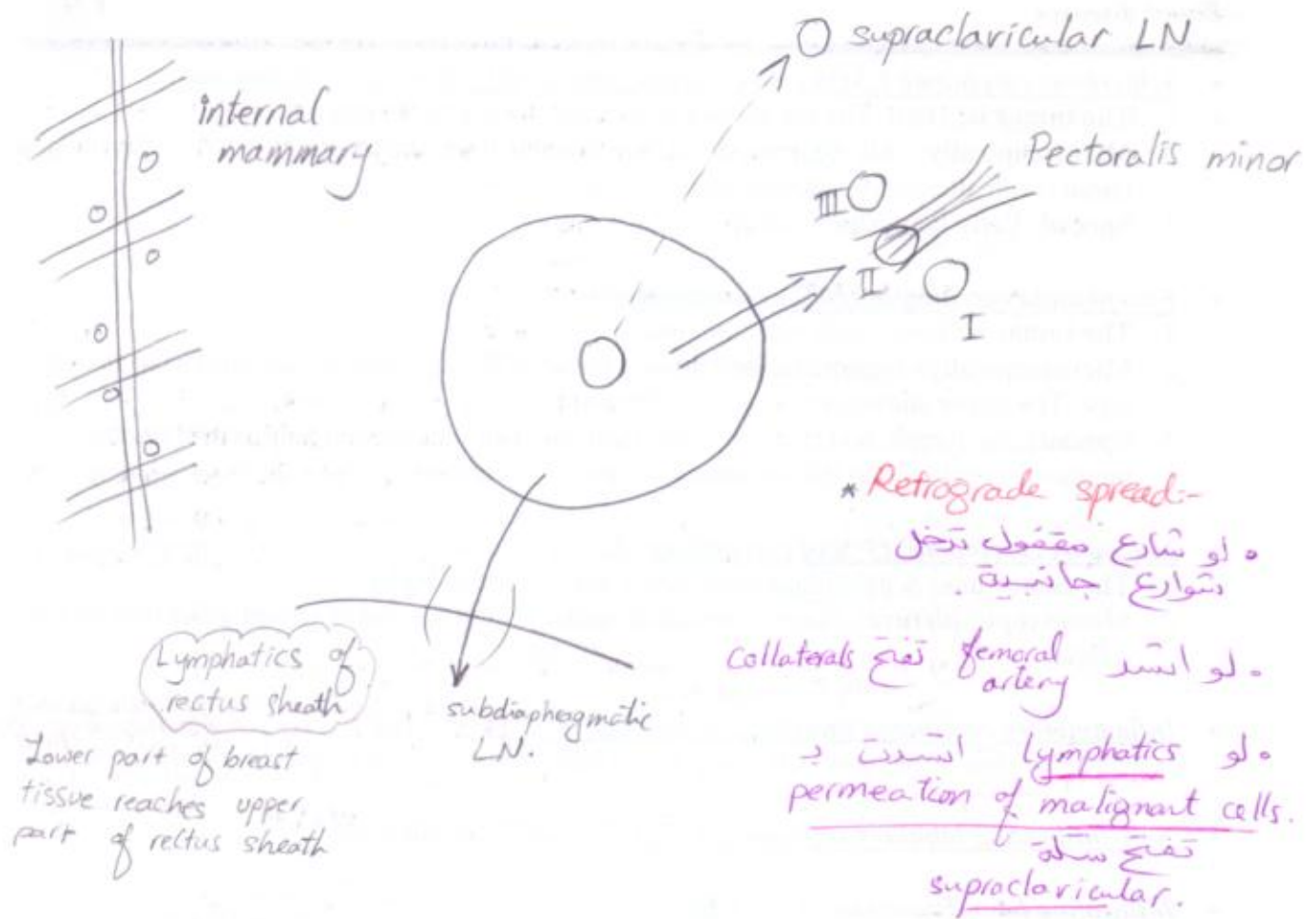
• Carcinoma of the lobules:

- Non-infiltrating lobular carcinoma (in situ) 0.7%.
- Infiltrating lobular carcinoma 7.5%

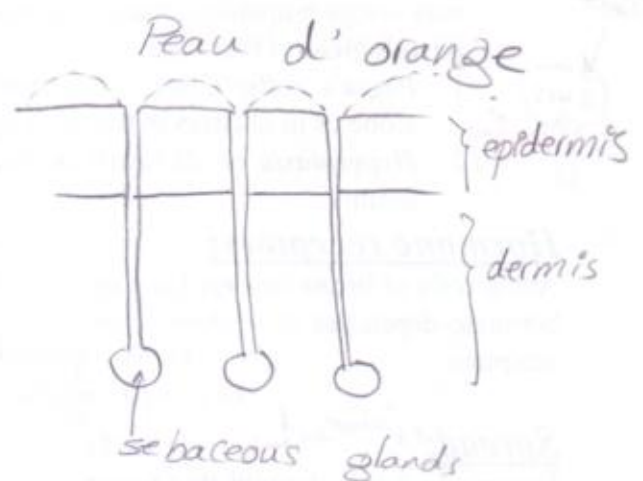
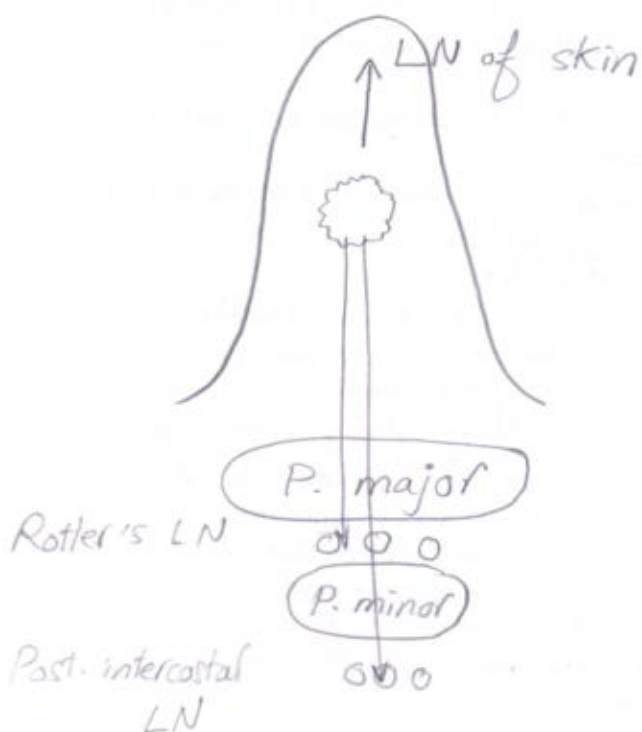
• Paget's disease of the nipple.

• Non-infiltrating papillary duct carcinoma: May cause bleeding from the nipple.

• Non-infiltrating comedocarcinoma: Central necrosis of cancer cells leads to the extrusion of a sebaceous like material from the cut surface of the tumor.



لو ال lymphatics لم سٹڈ
 لا نشیل
 پس بنشیل
 LN affected



5 year survival:

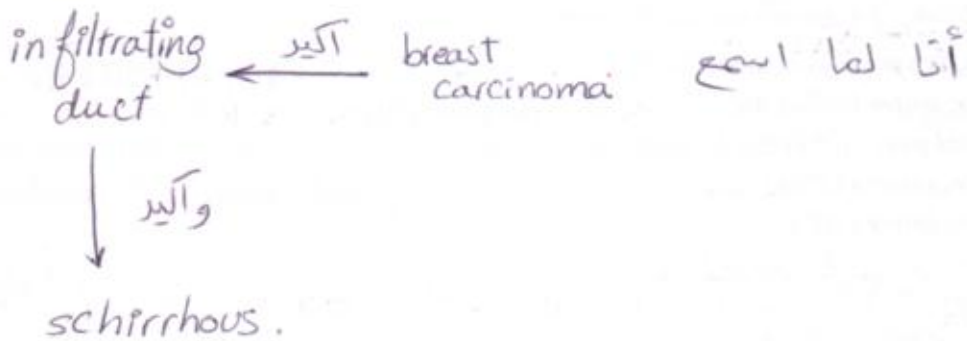
لو عالجتنا عيان وقعد ه سنين
with no residuals
نقوله مبروك انت خفيت

but in breast carcinomas.

ممكن تظهر residuals بعد ٧ أو ٨ سنين

So 10 year survival = 65 %

تلتهم بيوتوا من residuals الى احنا
ما شحنتهاش



سؤال شفوي: فين Paget في الصراحة؟؟

- 1- Bone
- 2- Breast
- 3- Perianal skin.
- 4- Paget test → clinical.

2- **Lymphatic spread:** By embolism and permeation is mostly to the axillary nodes, next common is the internal mammary chain. Involvement of the supraclavicular node is considered an advanced disease.

• **Axillary lymph nodes are classified into 3 levels:**

- من تحت
لغوق
- Level I: Below the pectoralis minor muscle. *Pectoral group*
 - Level II: Behind the pectoralis minor muscle. *Central group*
 - Level III: Above the pectoralis minor muscle. *Apical group.*

- **Mammary lymph nodes** lying along the internal mammary vessels in the first three intercostal spaces. They receive part of the lymph from the medial half of the breast.
- A few lymphatics pierce the pectoralis major muscle to drain into the inter-pectoral L.N. (**lymph nodes of Rotter**) and pass to the posterior intercostal lymph nodes.
- Lymphatics from the lower inner quadrant may pierce the rectus sheath to reach the peritoneal lymphatic plexus.
- Supraclavicular lymph nodes may be affected by retrograde lymphatic spread.
- **Obstruction of the dermal lymphatics** by malignant cells produces breast skin edema that is marked in the dependant part, i.e. the lower half of the breast. The edematous skin is pulled at the sites of hair follicles, sebaceous glands and sweat glands giving the appearance of an orange peel, hence the French name *peau d'orange*

3- **Blood stream spread:** Produces metastasis in the lungs, bones, brain and liver.

Staging:

A- International TNM staging:

T = Tumor *T_x 1ry cannot be assessed*

- **T_{is}:** Carcinoma in situ. Paget's disease with no palpable tumor.
- **T₀:** No evidence of primary tumor.
- **T₁:** 2 cm diameter or less.
- **T₂:** 2-5 cm diameter.
- **T₃:** Tumor larger than 5 cm.
- **T₄:** Any size with direct extension to *Ribs* chest wall or to skin.

N = Nodes

- Early LN → stage II Manch.*
Late LN → stage III Manch.
- **N₀:** No palpable axillary nodes.
 - **N₁:** Mobile palpable homolateral axillary nodes.
 - **N₂:** Fixed homolateral axillary nodes.
 - **N₃:** Palpable homolateral supraclavicular nodes. Edema of the arm.

M = Metastases

- **M₀:** No evidence of distant metastases.
- **M₁:** Distant metastases.

B- Manchester classification:

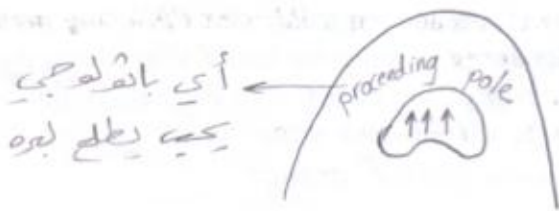
- في التكتيكات*
- **Stage I:** = *early 1ry*
 - A mobile mass in the breast. → *attached to cooper's lig. not to skin.*
 - **Stage II:** = *early 1ry ⊕ early LN.*
 - A mobile mass in the breast with or without skin tethering.
 - Palpable mobile homolateral axillary nodes.

Mass mobility:-

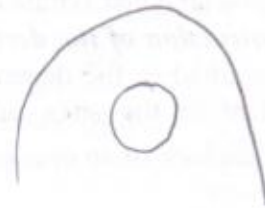
Breast mobile with the breast → any mass not fixed.
 Breast mobile within the breast → fibroadenoma.

Concave
under surface

Globular
under surface



Malignant
pulled by
fibrous tissue



Benign

• **Stage III:** *late 1st or late LN*

- late 1st* {
late LN {
 ○ Peau d'orange larger than the tumor but still limited to the breast.
 ○ Tumor fixed to pectoral muscle but not to the chest wall.
 ○ Homolateral axillary lymph nodes matted together or fixed to chest wall.
 ○ Homolateral supraclavicular lymph nodes.
 ○ Edema of the arm.

• **Stage IV:**

- Skin involvement wide of the breast (*cancer en cuirasse*).
 ○ Fixation to the chest wall.
 ○ Distant metastases.
 ○ Involvement of the opposite breast or axilla.

distant spread include
 other breast
 other axilla
 fungation

Clinical Features:

Symptoms:

- 1- The patient accidentally notices a *painless lump* in the breast. An accidental trauma to the breast may attract the attention of the patient to presence of the lump.
- 2- Much less frequently the disease is discovered because of *mild breast pricking pain, nipple retraction* or *blood stained nipple discharge*.
- 3- Picture of **metastasis** (lymph node or blood).
- 4- The disease may be discovered by *routine screening mammography*.

Painful
 ✓✓✓ *painless* > Breast carcinoma
But don't exclude carcinoma by pain

Signs: *العلامات السريرية*

Some of the following signs may be detected:

• **Breast:**

- Asymmetry. → *Normally there is slight asymmetry b/n both breasts.*
- Enlargement.
- Skin dimpling.
- Skin puckering.
 Dimpling and puckering of the skin are evident when the patient is sitting and elevates her arms.
- Peau d'orange (orange peel)
- Skin nodules.
- Skin ulceration.
 Peau d'orange, skin nodules, and ulceration indicate a locally advanced disease.

• **Mass**

- Hard. *Most imp. sign in breast carcinoma.*
- Irregular.
- Ill-defined. → *(well circumscribed)* *Hard mass in soft tissue*
- Restricted mobility within the breast substance. *but may be mobile with breast.*
- Fixation to the skin, underlying muscles, or chest wall, if present, is diagnostic of carcinoma.

• **Nipple:**

- Recent retraction.
- Change of direction.

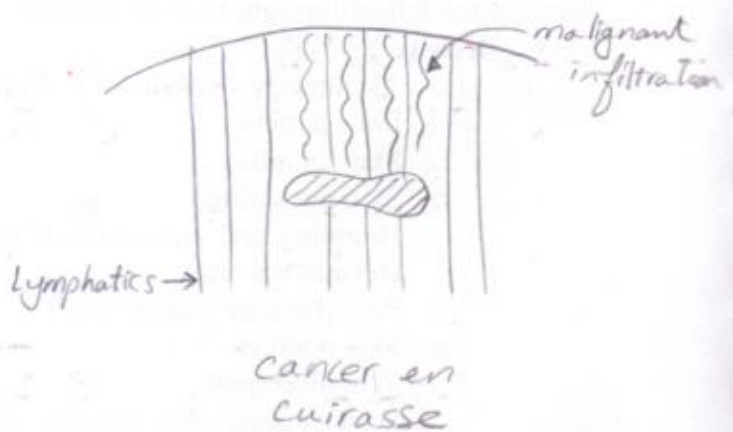
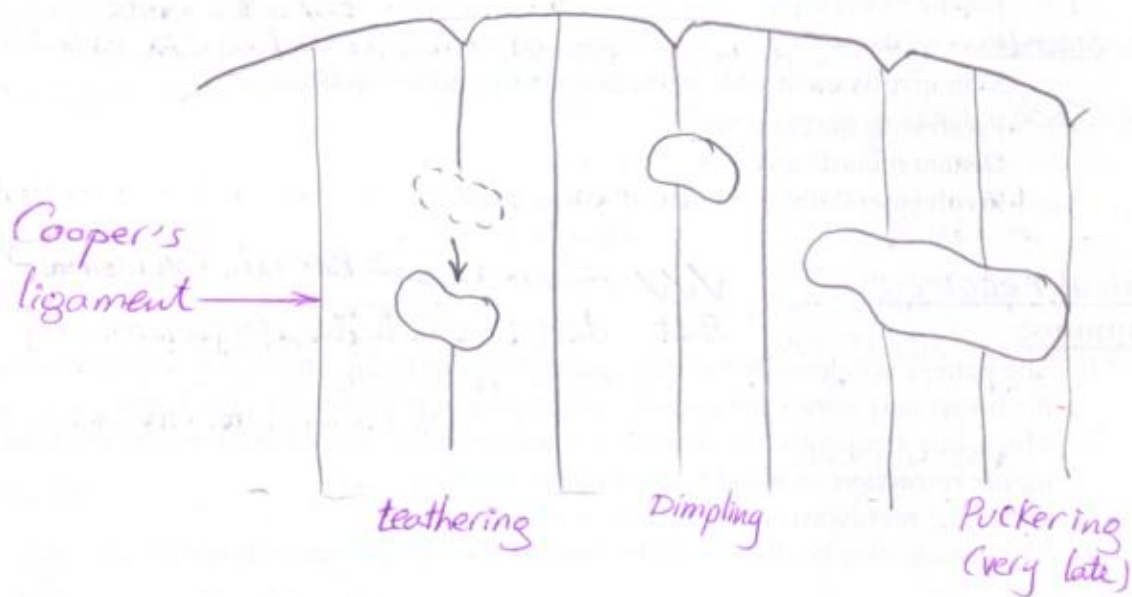
• **Axillary and supraclavicular nodes**

Number and mobility of palpable nodes are assessed

• **Distant metastases**

- Chest examination.
- Hepatomegaly.
- Ascites.
- Pelvic examination for hard deposits or Krukenberg tumor.

* All breast masses are fixed to Cooper's lig. except fibroadenoma.



How skin manifestations affect stagings:-

- ① Feathering - Dimpling - Puckering & peau d'orange limited to tumor → don't affect staging.
- ② Peau d'orange wider than tumor but limited to breast → stage III
- ③ skin ulceration - fungation - nodules - cancer en cuirasse - peau d'orange wider than breast → stage IV ???

Skin manifestations of breast cancer:

- 1- **Dimpling and puckering of the skin:** Overlying the tumor. This is the *earliest* manifestation of superficial tumors. It is due to infiltration of Cooper's ligaments by the tumor, pulling the skin toward the tumor. (Cooper's ligament: Are conical fibrous tissue normally connecting the skin to the pectoral fascia). *If deep → won't appear*
- 2- **Fungation.**
- 3- **Ulceration:** Ulcer is always indurated.
- 4- **Skin nodules:** Near or far from the tumor, even around the umbilicus. They are due to lymphatic spread. *Sister Joseph sign.*
- 5- **Peau d' orange:** non-pitting edema due to obliteration of the skin lymphatics by malignant permeation & ~~surrounding~~ fibrosis. The pits giving skin the orange appearance are due to hair follicles, sweat glands & sebaceous glands anchored to the skin. *استرخا من lymphatic spread*
- 6- **Cancer en cuirasse:** In very late cases, due to malignant infiltration ~~and~~ fibrosis of the skin as well as lymphatic obstruction, the skin is very hard, very thick, and non-mobile like a shield. *جلد قديم جدا و ثقوبت very rare*
- 7- **Nipple:** Is retracted.
- 8- **Paget's disease** of the nipple.

Special clinical forms:

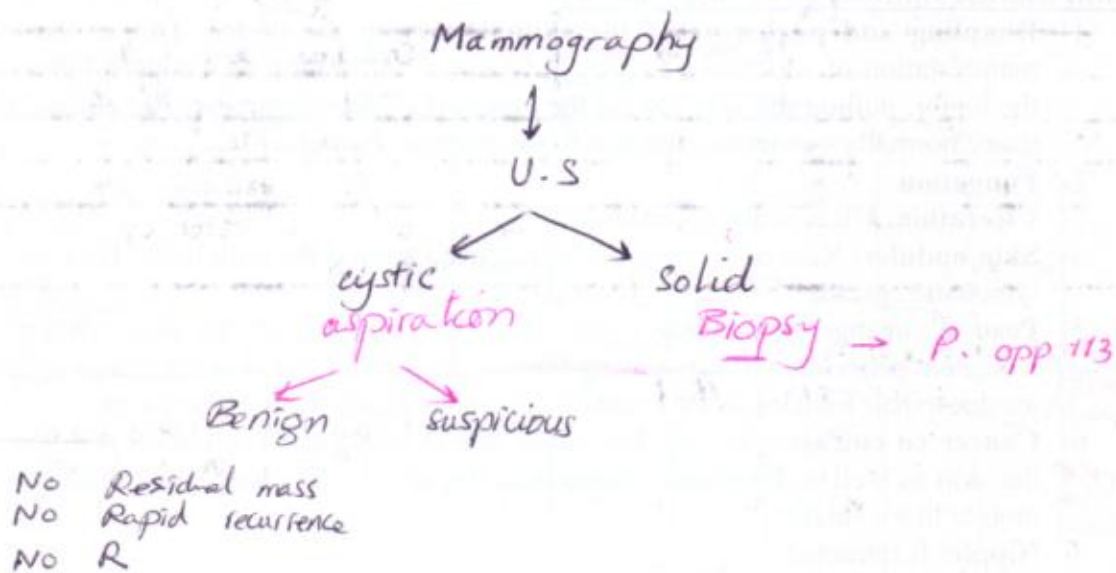
1- Paget's disease of the nipple: (1 % of breast cancers)

- The first symptom is often an abnormal pricking sensation of the nipple, with superficial erosion.
- A tumor mass may not be palpable.
- The lesion is commonly mistaken for eczema.
- The diagnosis is established by biopsy of the erosion.

<i>Paget's disease</i>	<i>Eczema</i>
1- Unilateral	Commonly bilateral
2- Usually occurs at menopause	Commonly occurs at lactation <i>young age.</i>
3- No itching	Itching
4- No vesicles-not oozing (dry)	Vesicles-oozing
5- Nipple is eroded	Intact nipple
6- <i>skin affected by malignancy</i> Well-defined margin	Ill defined margin
7- A breast lump may be felt	No lump
8- No response to eczema treatment	Responds to treatment

II- Inflammatory carcinoma:

- This is a rare aggressive form of breast cancer.
- Usually occurs during pregnancy or lactation. *في سن صغير*
- There is a rapidly growing, sometimes painful, breast swelling. The overlying skin becomes red, edematous and warm. Often there is no distinct mass, since the tumor infiltrates the breast diffusely. *> 1/3 breast dusky.*
- The picture clinically resembles acute mastitis.
- The prognosis is poor as it is usually advanced at the time of diagnosis.



<i>Inflammatory carcinoma</i>	<i>Acute bacterial mastitis</i>
Gradual onset with no or low grade fever	Acute onset with high fever
Progress is slower	Rapid progress
Involves more than one third of the breast	One breast sector is affected
Skin is dusky red لون القسيق	Skin is rosy or bright red عماري
Mildly tender or non-tender lesion	Markedly tender lesion
Non-tender axillary nodes	Tender axillary nodes
No response to antibiotics in one week is an indication for biopsy	The lesion is either cured by antibiotics or forms an abscess

Carcinoma is not an emergency.

اجرب الدواء (حتى لو اضر بك اسبوع من مشكلة)

III- Carcinoma in situ:

a) Lobular carcinoma in situ (LCIS):

It is a mammographic finding that is confirmed by biopsy. It doesn't progress to invasive cancer, but it is a powerful marker of increased risk of malignancy in the same or the other breast, close observation is all that is needed.

b) Intraductal carcinoma in situ (DCIS):

May present as a mass or as a mammographic finding. It is a true malignancy that is treated by mastectomy.

Differential Diagnosis:

A- Case presenting by a lump (mass):

	<i>Carcinoma</i>	<i>Solitary cyst</i>	<i>Fibrocystic disease</i>	<i>Fibroadenoma</i>
Age	Usually above 35 yrs	35-55 years	20-55 years	15-30 years
Pain	Painless	Occasionally painful	Occasionally painful	Painless
Surface	Irregular	Smooth surface	Indistinct surface	Smooth may be lobulated
Consistency	Stony hard	Fluctuation is difficult to elicit, so it feels soft to hard	Firm, ill defined areas of thickening	Firm, highly mobile
Lymph nodes	Probably axillary node enlargement	Free axilla	Free axilla	Free axilla

Mobility within Breast

Restricted

Restricted

Restricted

freely mobile

The above lesions constitute 95 % of breast lumps.

Other less common causes are:

• Traumatic lesions: hematoma and fat necrosis.

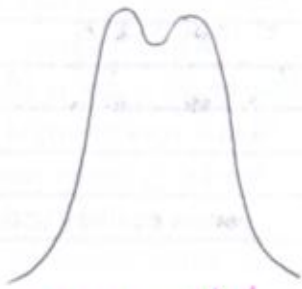
- *Breast hematoma: if with bruising → easy diagnosis → if old trauma → difficult.*
If there is no external bruising, a deeply seated old hematoma may form a hard mass that greatly resembles a carcinoma.

○ Traumatic fat necrosis:

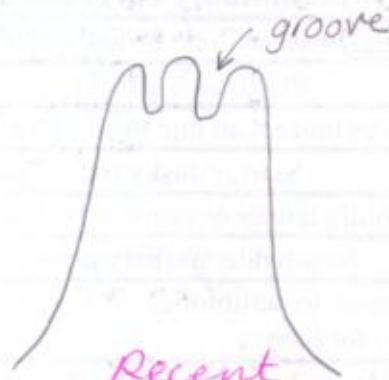
Blunt breast trauma may cause death of some of the fat cells. The liberated fatty acids combine with calcium to form calcium soaps. The result is one of two forms:

- A cyst that contains thick oily fluid is formed.
- Less frequently a hard mass, which resembles a carcinoma, is formed.

Nipple retraction



congenital



Recent
(acquired).

- since puberty
not since birth

- Recent

- Bilateral

- Unilateral

- No groove

- groove

- **Inflammatory lesions:** Chronic abscess, mammary duct ectasia & T.B.
 - **Chronic breast abscess:** *if history of acute abscess is missed → it will be very difficult to diagnose chronic abscess*
 - This is the result of improper treatment of acute abscess.
 - There may be (with the mass) nipple retraction and skin puckering, however it is more painful than carcinoma and is accompanied by low-grade pyrexia.
 - **T.B.:**
 - Presents as multiple cold abscesses & sinuses, or as multiple nodules in the breast substance. *+ TB toxaemia*
 - **Mammary duct ectasia:** *Plasma cell mastitis.*
 - The affected area is hard & may be associated with skin dimpling & nipple retraction simulating carcinoma.
 - It is called plasma cell mastitis due to predominance of plasma cells.
- **Other cysts:** e.g. Galactocele.
- **Other tumors:** Duct papilloma accumulating blood behind it and sarcoma (very rare).
- **Swellings arising from the chest wall:** Tuberculosis or tumor of a rib or lipoma.

B- **Paget's disease:** Should be differentiated from eczema of the nipple.

C- **Inflammatory carcinoma:** Should be differentiated from an acute breast abscess.

D- **Nipple retraction:** Two types of nipple retraction should be identified

- Long standing nipple retraction that dates back to puberty (congenital).
- Recent retraction is due to cancer or any breast lesion with excess fibrous tissue e.g. duct ectasia, chronic breast abscess.

Investigations:

Investigations aim at:

- 1- **Diagnosis** of carcinoma by **mammography, ultrasound and biopsy.**
- 2- **Staging** the disease is routinely done by chest X-ray, ultrasound examination of the pelvis & abdomen, and by alkaline phosphatase (a high level indicates bone or liver deposits).

metastatic work-up.

Further tests are needed in special situations. Bony pains require X-rays and isotope bone scan. Suspicion of cerebral secondaries is an indication for CT examination.

Some surgeons advise bone scan as a routine preoperative inv. as bone metastasis is common

Mammography:

*See Gd Jm
Radical surgery
علاج
مammography
لأنه صوب
fac*

Is soft tissue radiology of the breast. In expert hands it is 95% accurate in diagnosing breast cancer.

It is useful in detecting multifocal lesions in the same or other side.

A cancer appears as a dense opacity containing microcalcifications and has an indefinite outline.

It is important to exclude multifocal lesions in case of conservative surgery

Ultrasonography: Can differentiate between solid & cystic masses

Biopsy:

- 1- **Excision biopsy:** Is the most reliable and provides a big specimen to allow for hormone receptor estimation as well.

Breast subjected to open biopsy → disturbed breast

Disadv:- 2 operations in one week + disturbed breast

Mastectomy or Amputation → consent.

Metastatic work up.

Lung
CXR

Bone

- xray
- isotope bone scan.

Liver

- Alkaline phosphatase
- US abdomen

Brain

- CT scan.

Biopsy

أنواع الـ

التي نعرض ؟

Open biopsy :-

- ① Excisional → all mass
- ② Incisional → part of mass.

③ Frozen section biopsy «specific type of open biopsy»

Needle :

- ④ True-cut biopsy.

⑤ Fine needle aspiration biopsy → استشر واحدة
التي واحدة
بتشمل
needs expert cytologist
but highly accurate.



structures removed in radical mastectomy of Halsted



• What is meant by radical surgery in general?

Removal of 1ry & safety margin + draining LN in one mass.

• Is radical mastectomy of Halsted radical?

• No, «no removal of internal mammary nodes».

- 2- **Frozen section biopsy:** The biopsy is frozen and slides are prepared from the frozen block. A diagnosis is obtained within 20 minutes. Meanwhile, the patient is kept under general anesthesia. If the result is positive, the surgeon proceeds with radical surgery. Consent for mastectomy should be obtained preoperatively.
adv: results within 20 minutes.
disadv: not as accurate as excision biopsy.
- 3- **True-cut biopsy:** Is done under local anesthesia with a special needle that cuts a core of tumor tissue.
disadv: painful - haematoma formation
core ← true-cut ← cytology
- 4- **Fine needle aspiration cytology (FNAC):** It depends on examination of cells to detect criteria of malignancy in them. The aspiration can be done in the outpatient clinic using fine needle. A skilled cytologist is needed.
cells → cytology

Advantages: of FNAC

- 1- Very simple, inexpensive and accurate procedure.
- 2- Give a definite diagnosis in 90 % of cases.

disadvantage

Aspiration of a cyst:

A breast cyst is considered benign if:

- 1- The fluid is not blood stained. — *Red*
- 2- The cyst disappears completely with aspiration. — *No residual mass.*
- 3- Does not recur within 2 weeks. — *No recurrence*
- 4- In case of doubt, the fluid is subjected to cytological examination.

Early detection:

1- Breast self examination:

All women over age of 20 years should be advised to examine their breasts monthly, one week after the menstrual period. The physician instructs the woman as how to conduct a systematic inspection and palpation.

2- Screening programs:

In some Western countries, high risk women are subjected to regular clinical examination and mammography, every one or three years.

Treatment:

A- Early (potentially curable) breast cancer:

- This is defined as those cases categorized as T₂N₁M₀ or less (stage I and II in Manchester classification)

Surgery with or without Radiotherapy:

Different surgical options are available (all of them give almost equal results):

1- Radical mastectomy (of Halsted) :

It involves removal of the following structures in one block:

- a- A skin ellipse over the tumor with at least a 5 cm safety margin including the areola and nipple. *& site of biopsy.*
- b- The whole breast including the tumor.
- c- The sternocostal head of pectoralis major and the pectoralis minor muscles.
- d- All axillary lymph nodes and axillary fat medial to axillary vein.

NB: lat LN are left to drain UL

Breast diseases

2- Modified radical mastectomy (of Patey):

This is the ~~most widely used operation~~ ^{not main drainage}. The operation differs from Halsted's radical mastectomy in preserving the pectoralis major muscle, thus providing better function and appearance. The pectoralis minor muscle is either removed or its insertion is cut.

→ aim: to get access to axilla.

After radical & Patey's mastectomy radiotherapy is advised for patients with:

- 1- Positive axillary lymph nodes. to avoid local recurrence.
- 2- Tumors in the medial half of the breast.

→ because internal mammary nodes are left.

3- Conservative therapy:

It includes:

- Local wide excision with a 2cm safety margin. If the lesion is close to the skin, part of it may be excised.
- Excision of axillary nodes (axillary clearance).
- Postoperative radiotherapy for 4 weeks directed to the breast.

Advantages:

- a- If done for the properly indicated patients, the operation provides good results that are equal to radical mastectomy.
- b- The breast is preserved minimizing psychological trauma.

Indications:

- Small tumor ≤ 4 cm.
- Sometimes, large lesions (up to 5 cm) in large breasts.
- Peripheral lesions.

Contraindications:

- Pregnancy. → Radiotherapy is contraindicated
- Large or central tumors in small breasts (no cosmetic advantages).
- Multicentric disease as detected by soft tissue mammography.
- Collagen vascular disease (poor tolerance to radiotherapy).

3ab
a malignancy
is
psych. trauma

Adjuvant chemotherapy and hormonal treatment:

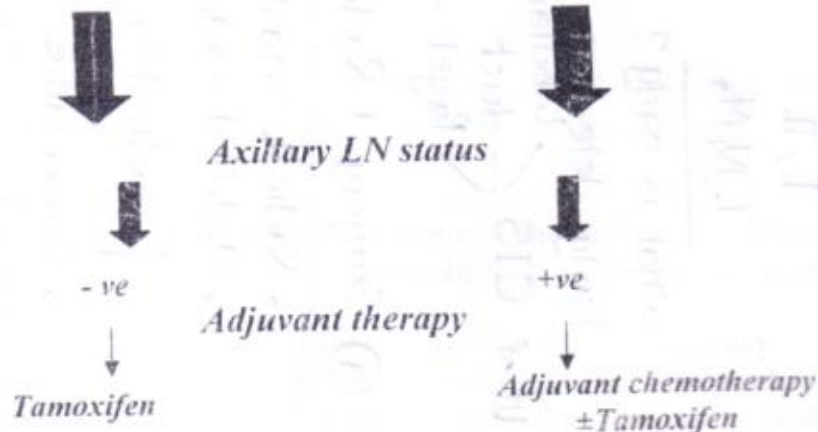
- Indications of chemotherapy: If axillary lymph nodes prove to be histologically malignant. The aim is to kill any potential distant micrometastasis.
- Regimen: CMF (cyclophosphamide, methotrexate and 5-fluorouracil).
- Adjuvant tamoxifen, which is an antiestrogen, has recently proved useful particularly for postmenopausal women. It is given as 10 mg tablets twice daily for life.

Primary treatment

Modified Radical Mastectomy

or

Conservative therapy



سؤال: extended radical mastectomy &
Removal of int. mammary nodes
+ Halsted radical mastectomy.

were done
because
السكران كانوا
يموتوا بعد
Halsted
بس هم كانوا
يموتوا من
metastasis.

سؤال Super-radical mastectomy &
Removal of supraclav. LNs.
+ Halsted

« int. mammary nodes are not removed »
Removed only in extended radical.

? Radical & nipple, areola & skin ellipse ال
? pectoral muscles. وليه كانوا بدسيلوا ال

Retroareolar plexus of sappy } were thought to be
& Rotter LN « interpectoral » } the main drainage of
the breast.

للإجابة في النظرى Treatment

Early

I, II

$T_2 N_1 M_0$

What is early?

Early detection

Lobular

duct

Observation

قبل الم

mass → mastectomy

Ⓐ Surgery ± Radiotherapy

• Radical mastectomy of Halsted

• Modified radical mastectomy of Patey

Radiotherapy

• Conservative

Ⓑ Adjuvant chemo & hormonal

indications

Regimen

Ⓒ Follow up

مشاكل
الإشعة
تكميل
المنع
المتخاض

سؤال ما يحيش

Late

III, IV

$T_2 N_1 M_0$

What is late?

Ⓐ Hormonal

indications

regimen

Ⓑ Chemotherapy

indications

regimen

Ⓒ Surgery → indications

Ⓓ Radiotherapy → indications

Ⓔ Specific problems

LRLB

مناقشة
0108271100

Criteria that usually come together in breast carcinoma

Breast diseases

- 1- Postmenopausal
- 2- Slowly growing
- 3- Hormone receptor (+ve)

A.H.

Follow up:

After treatment, patients are reviewed at regular intervals, usually 3 months for the first 2 years. 4-monthly for the next 3 years, and annually thereafter.

This is required to:

مشاكل 1- Detect and treat complications of mastectomy:

- a. **Psychiatric morbidity** caused by loss of the breast.
- b. **Arm edema** results from:
 - Excision of lymphatics. *early*
 - Lymphatic obstruction by radiotherapy. *early*
 - Lymphangitis caused by infection. *Late*
 - Malignant axillary recurrence blocking them. *Late*
 - Thrombosis of the axillary vein. *early*

How to avoid:

- a- Avoidance of radiotherapy to the axilla, which has been surgically evacuated of its nodes, reduces the possibility of lymphatic edema.
- b- The patient is warned to avoid minor trauma to the ipsilateral hand & should wear gloves when carrying out rough work in order to avoid infection & lymphangitis.

في الحقيقة ← مستحيل

Treatment: (difficult) Arm elevation, massage and elastic or pneumatic arm compression are partially effective. →

ارتجاع أشعة 2- Detect local recurrence or distant disease.

نكبر 3- To do annual mammography of the contralateral breast.

- 4- Ladies who are free of the disease after two years can be considered for breast reconstruction using: → **obscuring local recurrence** → **wait for 2 years**
- Either a synthetic implant or a myocutaneous flap (e.g. Transverse Rectus Abdominus Myocutaneous flap **TRAM**). Some surgeons prefer an immediate reconstruction with the mastectomy for low risk patients.

- 5- **Patients are instructed:** Not to get pregnant for at least three years, and to use non-hormonal contraception. *affect hormone pattern*

B- Advanced (incurable) breast cancer:

Cases more advanced than T₂N₁M₀ (stage III and IV in Manchester classification). Endocrine therapy and chemotherapy are the two main lines of treatment. Surgery and radiotherapy are of secondary value.

1. Endocrine therapy:

Patients who are more likely to respond are:

- 1- Postmenopausal women.
- 2- Estrogen receptor positive tumors.
- 3- Progesterone receptor positive tumors.

The methods in common use are:

- 1- Tamoxifen (Nolvadex tablets) is the first line hormone therapy. It is an antiestrogen that blocks the estrogen receptors preventing the hormone from activating the cancer cells. The dose is 10 mg twice daily.
- 2- An alternative to tamoxifen in premenopausal women is to do oophorectomy.
- 3- Progestins as medroxyprogesterone acetate are used when tamoxifen responders relapse.
- 4- Aminoglutethimide is an adrenal suppressant that may be used. Hydrocortisone administration is added to prevent its deficiency.

4- Slowly growing tumour

2. Chemotherapy:

Is indicated for:

- 1- Rapidly progressive disease.
- 2- Premenopausal women.
- 3- Receptor negative cases.
- 4- Hormone failure. *start with* → **Hormonal** → *less side effects*
→ *more effective*
- 5- Liver metastases.

Combinations commonly used include Cyclophosphamide, Methotrexate and 5-Fluorouracil (CMF).

3. Radiotherapy:

Used in the following situations:

- 1- Pain whether due to bone or soft tissue involvement.
- 2- To control tumor fungation.

4. Surgery:

Some cases of late 1st are treated by Halsted radical mastectomy → Halsted هازال حيا

Is indicated for the following cases:

- 1- Radical mastectomy may still be done for advanced local disease (stage III) as it provides good local control.
- 2- Simple mastectomy to remove fungating tumor.

Management of specific problems: LBLB

1- Hypercalcemia:

~~Treatment~~ Is correction of dehydration by IV fluids + frusemide + prednisolone.

Bone

2- Pathological fractures:

Internal fixation is used. The patient is given radiotherapy to the fracture site.

Brain

3- Cerebral metastases are treated by a combination of corticosteroids and radiotherapy.

~~Occasionally a solitary brain metastasis is suitable for surgical excision.~~

○ The requirements are:

- a- Well-controlled breast primary.
- b- A long life expectancy.
- c- An accessible area in the brain.

Bone

Paralysis

تعطل

4- Spinal cord compression requires urgent surgical cord decompression, with int. fixation followed by radiotherapy.

Lung

5- Superior vena caval obstruction: Requires urgent radiotherapy.

6- Pleural effusion: Commonly responds to systemic therapy and chest tube drainage. If not, local instillation of the cytotoxic bleomycin through the tube may be required.

Liver

7- Liver metastases: Chemotherapy.

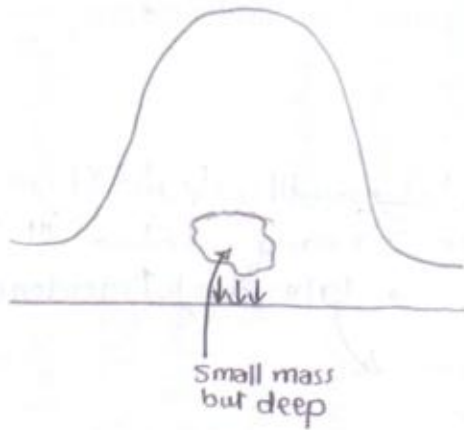
visceral pleural [pleura تلزق] → very painful

Local anaesthetics

Prognosis:

Prognosis of patients with carcinoma of the breast depends on the following factors:

- 1- **Type of the tumor.** The best prognosis is provided by the in situ carcinoma, and Paget's disease, while the worst is the inflammatory carcinoma.
- 2- **The T stage of the primary tumor.** The higher the T stage, the worse is the prognosis.
- 3- **Size, mobility, number and location of the involved lymph nodes.** Assessment of lymph node involvement depends on the histological examination.



early infiltration of pectoral muscles & fascia

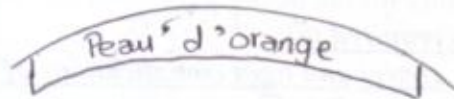
= Stage III

Palliative

حرام أعملها

↓
Halsted R.M.

Halsted مازال حيا



If peau d'orange > mass

= Stage III

Palliative

حرام أعملها

↓
Patey M.R.M



صدق أو

واحدة عندها mass (3x3cm) + multiple bone metas.

← Stage IV ← عيانة انتهت رغم ان الـ mass صغيرة

Primary

أسباب الـ

لأنها لوبعت metastasis النفاذه

قبل ما تعمل Symptoms هتكون شيعناها لثواها الأخير

Simple mastectomy

radiotherapy ← أدبلا

فونجtion إما عمل

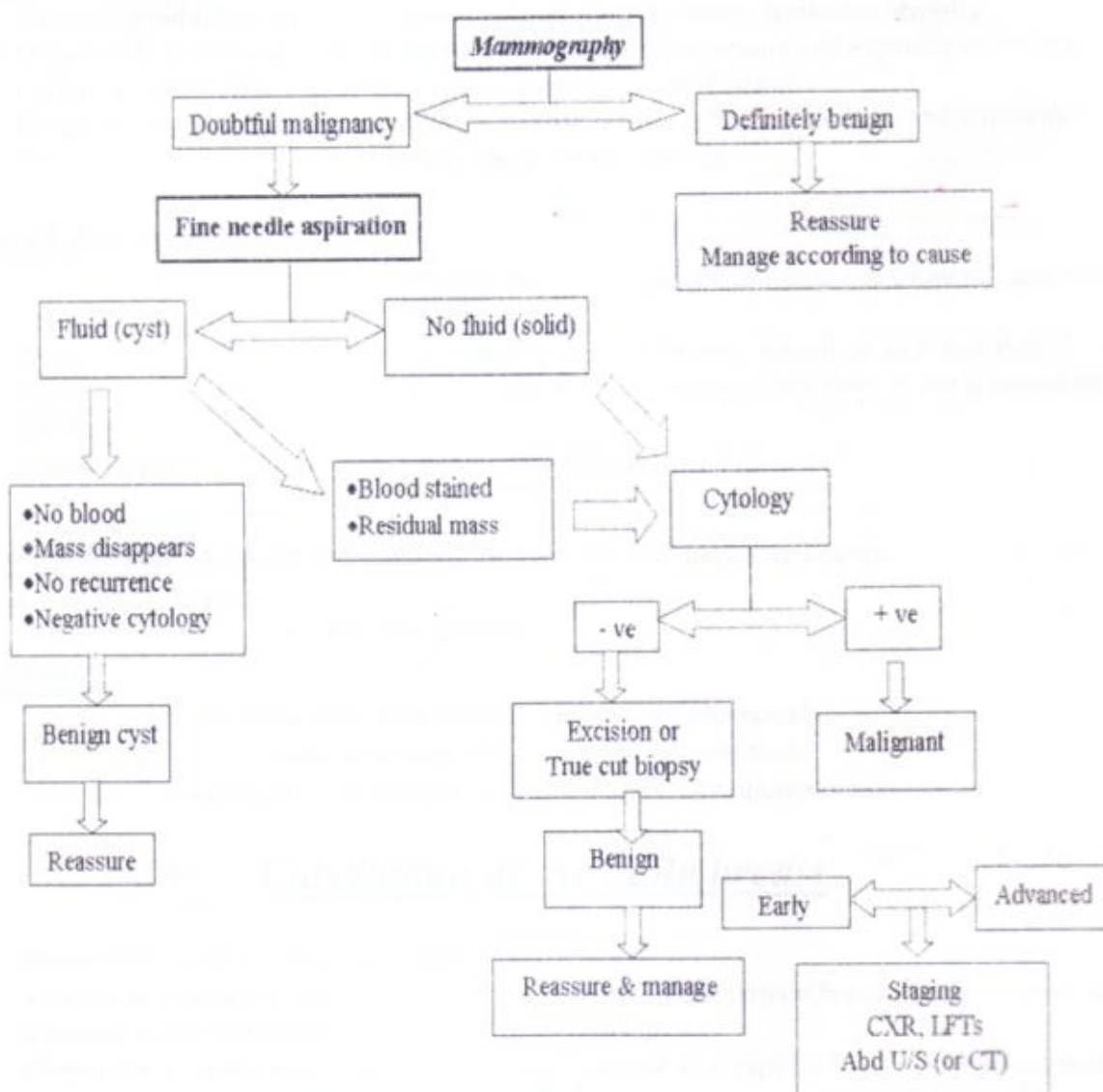
أو

قناوس

Breast diseases

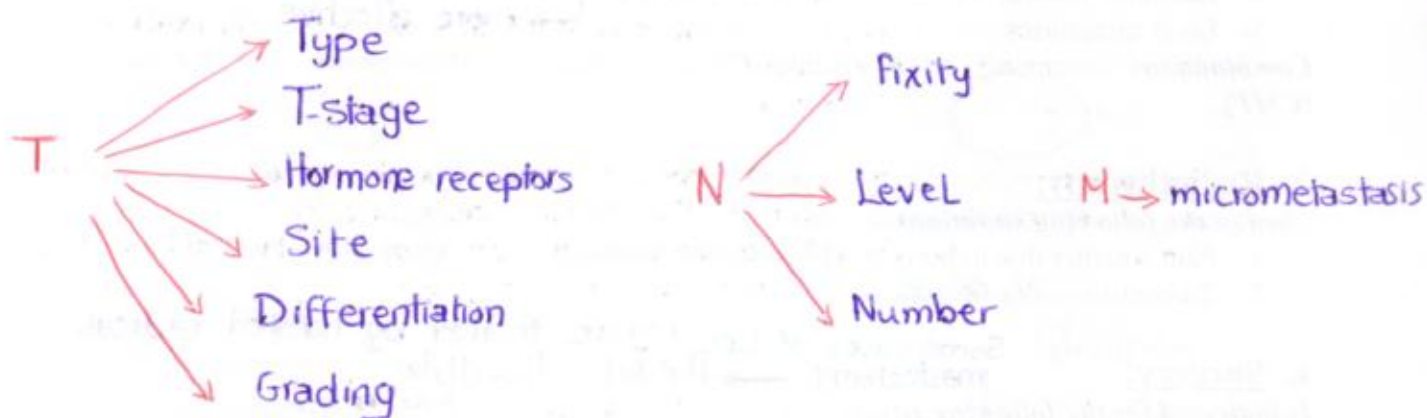
- Large **fixed** nodes are of bad prognosis.
 - The number of involved nodes largely affects the prognosis:
 - Patients with negative axillary nodes have a 10-year survival rate of 65 %.
 - Patients with 1-3 positive axillary nodes have a 10-year survival rate of 38%.
 - Patients with more than 4 positive axillary nodes have a 10-year survival rate of 13%.
 - The prognosis worsens the higher the level of the affected nodes in the axilla. High-level nodes carry a bad prognosis.
- 4- The presence of **distant metastasis**.
- 5- **Hormone receptor status**- Receptor positive tumors respond more often to hormonal therapy and have a better prognosis than those that are receptor negative.
- 6- **The site of the tumor**. Medial half tumors have a worse prognosis than those of lateral half due to early involvement of the internal mammary lymph nodes.

قراءة عامة على يرب Investigations of clinically doubtful breast mass



* Prognosis

TNM مبنی علی



شفوى
 مين الرجاله اللي يجيلهم breast carcinoma
 بنفس incidence زى الستات ؟؟
 Klienfelter syndrome

Diseases of the male breast

Gynecomastia

Definition: Generalized enlargement of the male breast.

Etiology:

A- Physiological:

- **Infantile gynecomastia:** Due to circulating maternal sex hormones it usually resolves within six months.
- **Pubertal gynecomastia:**
 - It occurs in up to 70% of normal pubertal boys.
 - It is often asymptomatic.
 - It usually resolves within 2 years.
- **Senile gynecomastia:** Due to the reduction of testicular function.

B- Secondary gynecomastia:

- 1- Reduced production of testosterone e.g. after orchidectomy, testicular atrophy.
- 2- High levels of estrogen caused by feminizing testicular tumors and suprarenal tumors.
- 3- Failure to metabolize estrogen in cases of chronic liver disease.
- 4- Drugs as estrogen, cimetidine, digoxin, spironolactone, phenothiazines. and cannabis.
- 5- Ectopic hormonal production in bronchogenic carcinoma.

Clinical features:

- The usual complaint is breast enlargement which may be unilateral or bilateral, and with or without tenderness.
- Examination reveals a subareolar mass (a disc of tissue), which is soft and mobile. Any induration, or fixation should raise the suspicion of malignancy (this is not a possibility in children and adolescents).
- Examination should include the abdomen and testes.

Investigations: These are not required for neonatal and adolescent cases.

- 1- Liver function tests.
- 2- Biopsy in suspected cases of malignancy.

Treatment:

- The neonatal and adolescent types usually resolve spontaneously.
- Secondary gynecomastia treatment of the underlying condition.
- Persistent gynecomastia can be treated surgically by subcutaneous mastectomy.

شفوی

Carcinoma of the male breast

Jar واحد

- **Incidence:** male : female carcinoma = 1:100.
- **Staging & treatment** similar to that for carcinoma of the female breast, but castration is the principal mean of hormonal control of advanced cases.
- **Prognosis** is worse than that of female breast cancer as it rapidly becomes attached to the skin & chest wall.

1- Early Local Spread

2 - Operations more difficult

3 - ♂ are ~~unaware~~ unaware about breast carcinoma

Differential diagnosis of breast pain

- 1- Itching pain:
 - a. Ordinary eczema
 - b. Scabies.
- 2- Burning pain: Cracked nipple.
- 3- Acute dull pain:
 - a. Milk engorgement.
 - b. Acute mastitis.
- 4- Throbbing pain: Acute abscess (suppuration).
- 5- Dull ache related to menstruation: Fibroadenosis.
- 6- Carcinoma is painless, rarely painful from:
 - a. Associated abscess.
 - b. Nerve infiltration.
 - c. Mastitis carcinomatosa.

Differential diagnosis of retracted nipple

1- Congenital:

- Present since childhood. Nipple fails to develop.
- It is due to failure of the nipple to follow the growth of the breast.
- The retracted nipple possess difficulty only when the lady is lactating, and is a predisposing factor for the development of mastitis. The problem may be spontaneously corrected during pregnancy or lactation.

2- Recent:

- Nipple was normal. Retraction resulted from excess fibrosis in:
 - Carcinoma is the most important cause.
 - Chronic inflammation: Chronic abscess, mammary duct ectasia and tuberculosis.
 - Fibroadenosis (rare).

Causes of huge breast

- 1- Sarcoma.
- 2- Mastitis carcinomatosa.
- 3- Encephaloid carcinoma.
- 4- Colloid carcinoma.
- 5- Soft fibroadenoma. = Cyst sarcoma phylloids
- 6- Diffuse massive hypertrophy.

Face & Mouth

Development of the face

The face is formed of 5 processes:

- 1- Frontonasal process.
- 2- Two maxillary processes.
- 3- Two mandibular processes.

Congenital anomalies of the face

A- Abnormalities due to failure of fusion:

1- Facial clefts:

- a. Craniofacial clefts.
- b. Cleft lip
- c. Cleft palate.

The last two defects are the most common congenital anomalies of the head (1:700 live births)

- 2- Preauricular sinus.
- 3- Macrostomia.

B- Abnormalities due to excessive fusion:

- 1- Microstomia.
- 2- Narrow palpebral fissure.

C- Dermoid cyst.

*Clinical joins
Short Case*

Cleft Lip



Unilateral incomplete cleft lip



Unilateral complete cleft lip



Bilateral complete cleft lip

Etiology:

Failure of fusion between the median process of the frontonasal prominence and one (unilateral) or both (bilateral) maxillary processes.

Etiological factors include:

- 1- Familial disease due to genetic susceptibility.
- 2- Consanguinity.
- 3- Prenatal exposure to alcohol, anticonvulsants, X-ray or virus infection.

Cleft lip may be associated with other congenital anomalies in up to 35% of cases.

Pathology: (Types) or bilateral

- 1- **Unilateral** 85% or **bilateral** 15%. Rarely median and very rarely in the lower lip.
- 2- **Complete** (reaching the nostril floor) or **incomplete**.
- 3- The cleft lip may be **simple** or **complicated** (if it is associated with cleft palate or alveolus).

* Written

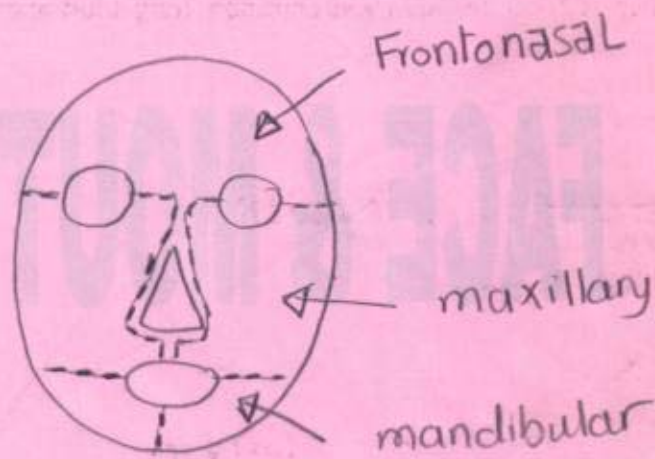
tongue ulcers
tongue carcinoma
dow swellings

* Clinical

cleft lip
cleft palate }

जैसा
clinical

* No operative - No anatomy



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Face & mouth

Effects on function:

- 1- Cleft lip does not interfere with suckling, but may be associated with abnormal teeth growth.
- 2- Psychological upset of the parents.

Management:

Operation is best performed at the age of 3-6 months (*before teething*). The infant should be at least 10 pounds in weight and the hemoglobin level should be at least 10 gm %. *Role of Ten is given*

Principles of the operation:

- 1- Paring of the edges.
- 2- The lip is separated from maxilla to make the lip lax. *most important*
- 3- Suturing the 3 layers of the lip (skin, muscle, and mucous membrane).
- 4- In bilateral: The repair is done either as one stage or as two-stage operation.

(Preliminary orthodontic treatment might be indicated especially in protruded premaxilla).

Short Case Cleft Palate

Etiology:

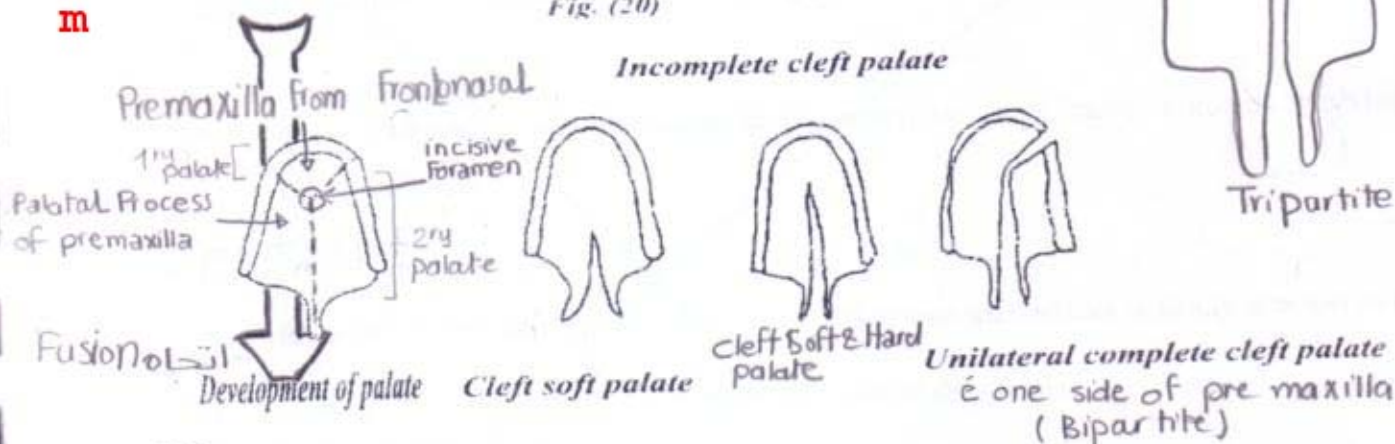
Due to incomplete fusion between the two palatal processes of the maxilla ~~and possibly the premaxilla~~ and possibly the premaxilla (from the frontonasal process).

Predisposing factors: See cleft lip.

Pathology: (Types)

- 1- Cleft uvula.
- 2- Cleft soft palate.
- 3- Cleft soft and hard palate ~~and possibly the premaxilla~~.
- 4- Complete cleft palate plus one side of premaxilla (bipartite).
- 5- Complete cleft palate plus the two sides of premaxilla (tripartite).

Fig. (20)



N.B:

- A cleft in the structures anterior to the incisive foramen is called **cleft of the primary palate** while that posterior to the incisive foramen is called **cleft of the secondary palate**.

- X. ~~May be associated with cleft lip~~
- X. ~~May be associated with cleft lip~~



كيف تتعامل مع حالة
cleft Lip
cleft palate
في الامتحان

History

- 1- Consanguinity
- 2- Prenatal History
- 3- Similar conditions

إوعي تسألها في عيادتك

وفي الامتحان تقول للأم:

دي أسئلة عرة هسألها لك بس
هي ملهاش أي لزومة في العلم الحديث
بس الأساتذة الجبر اللى هنالك دول
هيسألوني فيها

General Exam

associated anomalies

اسمع قلبه

Local Exam

type

e.g. Unilateral Complete cleft lip
with cleft alveolus

Effects on function:

- 1- Impairment of normal suckling, due to inability to create a negative intraoral pressure.
- 2- Regurgitation predisposes to aspiration pneumonia.
- 3- Recurrent otitis media, which may lead to hearing loss.
- 4- Speech defects secondary to:
 - a- Nasal tone due to nasal-oral communication.
 - b- Hearing loss.
- 5- Interference with normal teething.

Management:

- Timing of the operation: At 12-18 months (before phonation).
- **Preoperative management:**
 - 1- Attention to feeding. As there is inefficient breast-feeding, a bottle with a large hole is used or spoon-feeding is used in an upright position.
 - 2- Attention to chest troubles.
- **Principles of surgery:**
 - i- Paring of the edges.
 - ii- Lateral ^{release} relaxation incisions are needed.
 - iii- Suturing is done in 3 layers in the middle line (nasal mucosa, muscle layer then oral mucosa).
 - iv- Fracture of the pterygoid hamulus to relax the tensor palati.
 - v- Pharyngoplasty may be added to narrow the nasopharyngeal isthmus.
- **Post-operative follow up:**
 - Speech therapy.
 - Tonsillectomy and adenoidectomy are better avoided.
 - Orthodontic treatment.

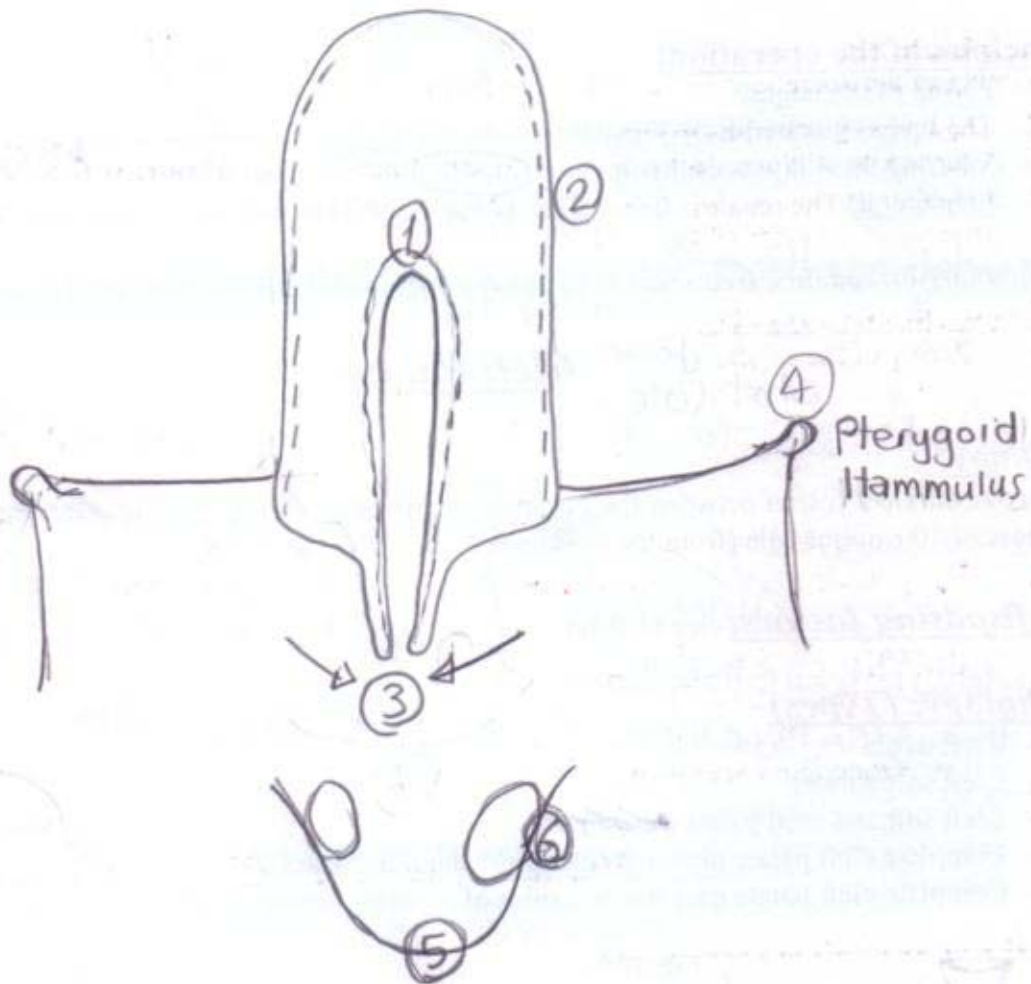
Fractures of the mandible**Etiology:** traumatic or pathological.**Site:**

Fractures may occur in the body (the commonest), symphysis, angle, ramus, coronoid or alveolar process.

Clinical picture:

- As general.
- Are usually compound into the mouth because the mucoperiosteum is firmly attached to the bone.
- **Coleman's sign:** swelling, hematoma in the floor of the mouth.
- There is irregularity of the line of the teeth.

Investigations: plain x-ray is diagnostic.



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Treatment:

- 1- **First-aid treatment:** the jaw is supported, analgesics, antibiotics & oral hygiene.
- 2- **Reduction & fixation:**
 - If there is displacement, reduction is done under anesthesia.
 - Fixation for 3 weeks is done by:
 - Interdental wire.
 - Arch bars.
 - Direct intermaxillary wire.
 - Interosseous wire.
 - In edentulous patients, the mandible is fixed by the use of fixed artificial dentures.

Carcinoma of the faceLip carcinoma

It is a squamous cell carcinoma of the skin of the lip. It is well differentiated (grade I and II according to Broder's classification) with the formation of cell nests.

Precancerous lesions: (All start by letter S)

- 1- **Simple tumor:** Squamous cell papilloma.
- 2- **Sepsis:** In oral cavity as dental ulcer.
- 3- **Smoking** (especially tobacco pipes).
- 4- **Syphilis.**
- 5- **Spices.**
- 6- **Sun rays** especially U.V. rays. Lower lip more liable



Fig. (21)

Clinical picture:

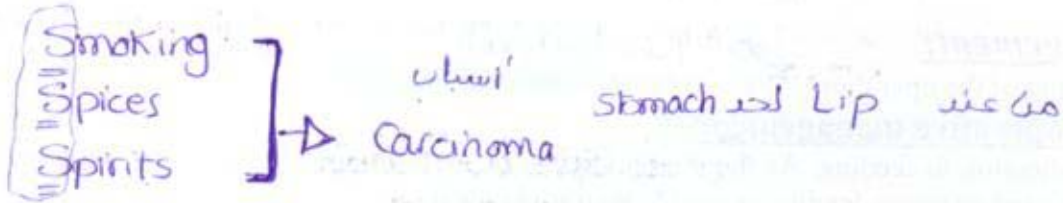
- More in men.
- **Age:** Above 60 years.
- **Site:** The lower lip is affected in 93 %, upper lip 5 % and the angle of the mouth 2 % (the last one is more malignant and infiltrates both lips).
- **Size:** Variable.
- **Shape:** Either **malignant ulcer** (commonest), **malignant fissure**, **malignant nodule**, **malignant cauliflower mass** or **diffuse infiltrating type giving woody lip**.
- **Edge:** Of the ulcer everted.
- **Margin:** Indurated.
- **Floor:** Malignant tumor tissue.
- **Base:** Indurated.
- **Discharge:** Blood.
- **Lymph nodes:** **Stony hard** and **painless**, at first mobile but later become **fixed**.

Complications:A- Spread:

- 1- **Local** involving the whole lip, mandible, maxilla or gum.
- 2- **Lymphatic spread:**
 - a- Lower lip to the submental and submandibular and upper deep cervical.
 - b- Upper lip to preauricular then deep cervical.
 - c- Angle to both groups of lymph nodes (so the poor prognosis of tumors of the angle).
- 3- **Blood stream:** Late.

قانون بريطة في الما جيسير و الدكتوراه و بيكار في بكارهوس

- Oral Cavity Carcinomas are sq. cell carcinoma differentiation وكل ما تحس لجوه يفل



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B- Secondary infection.C- Hemorrhage.D- Aspiration pneumonia.E- Difficulty in eating and in speaking.

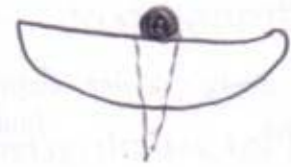
ماشي بصفحة زالة على شفقة
necrotic tissue

Treatment:

1- Irradiation of the primary and block dissection of secondaries. (Irradiation either by deep X-ray therapy or radium needles or mould)

2- Surgical excision: This is indicated in: (SBR)

- Small suspicious nodule or ulcer. To be sure of its pathology excision biopsy is essential.
- Cancer on top of syphilis as there is endarteritis decreasing the blood supply to the area. Irradiation effect depends on decreasing blood flow to the tumor, which is already decreased.
- If the bone is infiltrated.
- In recurrence after irradiation or radio-resistant.

Surgical management of the primary:

V-shaped excision of lip is done. If the mandible is infiltrated central hemimandibulectomy is combined with V shaped excision of the lip.

3- Treatment of lymph nodes: (Only 10% of patients have lymph nodes when first seen).

- If there is no lymph node enlargement: Monthly follow up, up to six months.
- If there is lymph node enlargement: It may be due to secondary infection. Wait for one month after that period if they are due to metastasis, suprahyoid block dissection of lymph nodes is done, in which submental, submandibular, upper deep cervical lymph nodes on both sides are removed as one mass (en block).

if proved to be malignant → Selective block neck dissection

Cystic swellings of the face

- External angular dermoid.
- Meibomian cyst.
- Mucocoele of the lacrimal sac.
- Meningocele.
- Sebaceous cyst.

	<u>Sebaceous cyst</u>	<u>Dermoid cyst</u>
<u>Cause</u>	Retention	Sequestration, implantation or teratomatous
<u>Site</u>	Any site especially: face, scalp and scrotum. Never in palm & sole.	Special site: line of fusion in face, midline & palm.
<u>Shape</u>	Hemispherical	Complete sphere
<u>Attachment to skin</u>	At one point	Not attached
<u>Age</u>	Adult	Dates since birth or childhood

don't diagnose Sebaceous cyst before puberty
يحدد وقت البلوغ

IF LN enlarged:

if proved to be malignant by FNBC → Select block
Neck dissection

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CLINICAL HISTORY

CLINICAL HISTORY

CLINICAL HISTORY

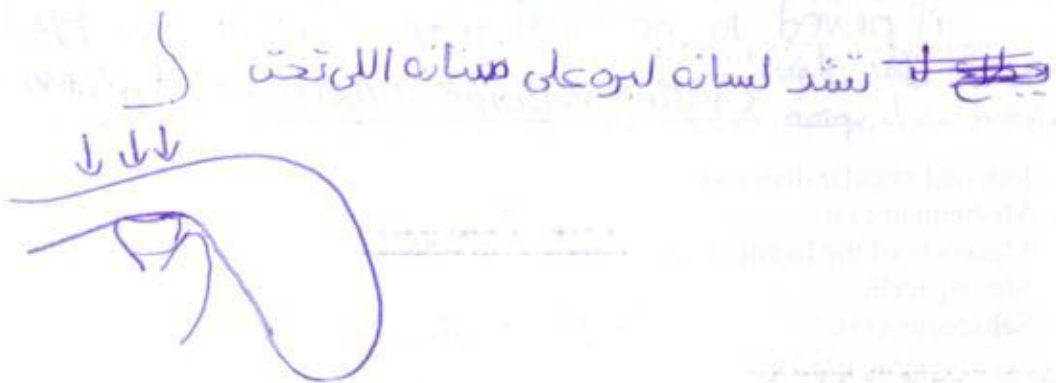
CLINICAL HISTORY

Ranula	Sublingual dermoid
etiology → • Retention cyst in sublingual Salivary gland • at one side of frenulum • translucent • Marsupialization (deroofing)	• inclusion (sequestration) dermoid • in middle line • opaque • excision

*ttt

شفوي

لو حصل injury في Tongue إزاي توقف النزف؟



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Cystic swellings of the floor of the mouth

1- Mucous cysts of minor salivary glands.

2- Ranula:

- It is a bluish painless swelling on one side of the floor of the mouth in the angle between the tongue and the floor. The swelling is cystic in consistency, translucent in appearance. The duct of the submandibular salivary gland is stretched over its surface. It may have a deeper prolongation in the neck in the submandibular region (*plunging or Thompson's ranula*).
- The wall is lined by columnar epithelium and the contents are clear gelatinous material.
- **Origin:** This is a retention cyst arising from a sublingual salivary gland or an extravasation cyst arising from a damaged sublingual gland.
- **Treatment:** Excision is very difficult (*as the wall is thin and adherent*). Partial excision of the roof, the edges of which are sutured to the mucosa lining the floor of the mouth (*marsupialization*) is the treatment of choice (*i.e. the floor of the ranula will form part of the floor of the mouth*).

3- Sublingual dermoid cyst:

- It is a sequestration dermoid cyst occurring in the midline either supramylohyoid appearing in floor of mouth or inframylohyoid appearing in the neck. It is lined by squamous epithelium and contains sebaceous material. The wall is thick. It is not translucent (*D.D. ranula*).
- **Treatment:** Supramylohyoid cysts are excised through the floor of the mouth. Inframylohyoid cysts are excised through a curved submandibular incision.

The Tongue

Tongue injuries

Treatment of tongue injuries

Bleeding is arrested by hooking the tongue forward with a finger and compressing it against the mandible. Then the lacerations could be sutured in the operating room.

Glossitis

Acute superficial glossitis:

- Pyogenic infection of the tongue is extremely rare.
- Gross swelling of the tongue due to insect bite or anigioneurotic edema may need nasopharyngeal airway insertion or a tracheostomy.
- Minor degrees of glossitis can occur due to scalding fluids, sepsis, diabetes, and alcoholism- This form presents by a painful red glazed tongue.

Chronic superficial glossitis

This is due to chronic irritation. It occurs in middle and old ages.

Pathology

- The disease affects the anterior two thirds of the tongue.
- There will be hypertrophied papillae, leukoplakia, red glazed tongue, cracks, fissures and warty projections.
- Chronic superficial glossitis is precancerous.

Treatment

1. Elimination of the irritating source.
2. Mouth wash.
3. In resistant cases, excision of the lesion.

Tuberculous glossitis

This is due to autoinoculation from pulmonary tuberculosis, through the sputum. The lesion presents either as a circumscribed interstitial tuberculoma or as shallow oval painful ulcers with overhanging margin.

Syphilitic glossitis

The tongue may be affected in any of the 3 stages of syphilis

- **Primary stage:** extragenital painless chancre at the tip of the tongue with enlargement of the submandibular lymph nodes.
- **Secondary stage:** Multiple shallow snail track ulcers appear on the sides and undersurface of the tongue. Mucous patches are present, Hutchinson wart (condyloma) may occur in the midline.
- **Tertiary stage:** gumma or chronic superficial glossitis. A gumma presents as slowly growing midline swelling get necrosed and separated as wash leather sloughs leaving a deep crater like-ulcer. A gumma has to be differentiated from carcinoma which usually does not occur in the midline and which produces tethering of the tongue.

مهم جداً نظري

Ulcers of the tongue**Traumatic:****A- Dental ulcer:**

- **Site:** Margin of the tongue.
- **Size:** Usually small.
- **Shape:** Circular.
- **Pain:** Usually present.
- **Lymph nodes:** Chronic inflammatory enlargement.
- **Treatment:** Removal of the septic tooth or denture is followed by healing of the ulcer.

B-Frenular ulcer: (Post-Pertussius ulcer)

Secondary to whooping cough due to severe protrusion of the tongue during cough.

- **Site:** Inferior surface of the tongue at the frenulum.
- **Size:** Small.
- **Surface:** Granulating.
- **Edge:** Sloping.
- **Base:** Not indurated.

Inflammatory:**A- Acute:****1- Dyspeptic ulcer:**

- **Etiology:** unknown.
- **Site:** The sides of the tongue and its dorsum and inner surface of lip and cheek.
- **Size:** Small.
- **Surface:** Covered with white scabs.
- **Base:** Not indurated.
- **Edge:** Sloping.
- **Margin:** Hyperemic.
- **Number:** Multiple.
- **Treatment:**
 - Of the cause. Paint ulcer with gentian violet.
 - Antiseptic mouth wash, alkaline lotion & anesthetic gel.

2- Herpetic ulcers:

- Painless, multiple, small ulcers.

3- Lichen planus: This is supposed to be due to an autoimmune mechanism. It affects the skin and oral mucosa and may cause ulcers plus hyperkeratotic lesions.**B- Chronic:****1- TB ulcer:** This type of ulcer is secondary to open pulmonary TB.

- **Site:** Dorsum of the tongue posteriorly and the tip of the tongue anteriorly.
- **Size:** Usually small.
- **Number:** May be multiple.
- **Floor:** Pale granulation tissue with multiple tubercles.
- **Edge:** Undermined.
- **Base:** Not indurated.
- **Pain:** Severe.
- **Lymph nodes:** TB lymphadenitis. Chest X-ray may show pulmonary T.B.
- **Treatment:** Anti-TB treatment, oral hygiene.

2- Syphilitic ulcer: Due to breakdown of a gumma.

Can occur in the secondary stage as snail track ulcers or in the tertiary stage as a gummatous ulcer.

- **Site:** Dorsum of the tongue in the midline.
- **Size:** Large.
- **Shape:** Rounded or circinate.
- **Edge:** Punched out.
- **Floor:** Wash-leather.
- **Base:** Indurated.
- **Pain:** It is painless.

3- Chronic superficial glossitis:

There is hyperkeratosis forming a white patch of thickening like smooth white paint (*leukoplakia*).

The *epithelium* may be shed out forming raw beef tongue. Later *submucous fibrosis* occurs leading to fissure formation. Associated *endarteritis obliterans* in the blood vessels deep to submucous membrane. These changes are *precancerous*.

Treatment: Care for oral hygiene. If leukoplakia is localized, excision is preferred.

Neoplastic ulcers: Squamous cell carcinoma (discuss).

Face & mouth Carcinoma of the tongue

موقع نظر
Sq. cell Carcinoma
تongue في

Incidence:

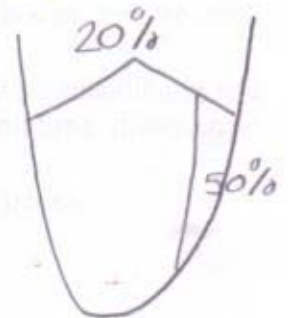
- **Age:** More above age of 60.
- **Sex:** male to female ratio used to be 10:1. Now, there is decrease in this ratio. Reduced male incidence due to improved oral hygiene, efficient treatment of syphilis. Increased female incidence due to increased smoking among females.
- **Geographical:** The disease has a high incidence in India because of increased tobacco chewers & use of spicy foods.

Etiology:

- **Predisposing factors:** Smoking, sepsis, spices, spirits, sharp teeth, clay pipe and bad oral hygiene.

Precancerous lesions are:

- 1- Syphilis
- 2- Dental ulcers.
- 3- Chronic superficial glossitis.
- 4- Papilloma of the tongue. simple tumor
- 5- Leukoplakia: It shows hyperkeratosis and possibly dysplasia.
- 6- Erythroplakia: This is deep reddening with mucosal atrophy.



Pathology:

- **Squamous cell carcinoma:** contributes in 90 % of cases.
Site: Lateral margin of the anterior two thirds (50 %). Posterior third 20 %. Less common sites are the ventral surface and the dorsal surface. The tip is rarely affected.

Naked eye appearance: It is either:

- 1- Malignant ulcer: See carcinoma of the lip.
- 2- ~~Raised oval plaque~~ Cauliflower mass
- 3- Hard submucosal nodule.
- 4- Deep indurated fissure.
- 5- Diffuse infiltrating tumor (woody tongue) is rare.

The surrounding mucous membrane may show leukoplakia.

Microscopic appearance:

- 1- Squamous cell carcinoma (less differentiated than that of the lip). Posterior 1/3 carcinoma is less differentiated.
- 2- Adenocarcinoma from the minor salivary glands is rare.

TNM staging: T_x

T ₀	No evidence of tumor.
T _{is}	Carcinoma in situ.
T ₁	< 2 cm.
T ₂	2-4 cm.
T ₃	> 4 cm.
T ₄	Involvement of the base.

T₄ can not be assessed

No evidence of tumor.

Carcinoma in situ.

< 2 cm.

2-4 cm.

> 4 cm.

Involvement of the base.

الغلوغة

مستوى في
Chest wall

breast في

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Operable (Surgery aiming for Cure)

radical surgery

= removal of T₁Y with safety margin
+ draining LN_s
+ intervening lymphatics

(+) Radiotherapy

Adjuvant chemo & Hormonal

Neoadjuvant therapy

= understaging of a case
used in Locally advanced diseases preoperatively
e.g. Breast Carcinoma, Wilm's tumor

In Operable

(Surgery not Curative)

*Criteria inoperability:-

- extensive Local Spread
- extensive lymphatic Spread
L.N. (Level J)
- Blood Spread except Colorectal Carcinoma
- Unfit patient

Resectable Irresectable

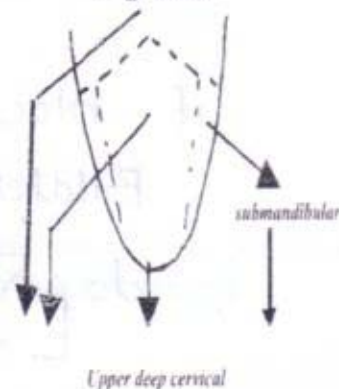
↓
palliative resection
(resection of T₁Y only & no safety margin)

↓
analgesic
chemo
radio

LN

- N₀ No lymph nodes.
- N₁ Ipsilateral single node < 3 cm.
- N_{2a} Ipsilateral single node 3-6 cm.
- N_{2b} Ipsilateral multiple nodes < 6 cm.
- N_{2c} Bilateral or contralateral nodes < 6 cm.
- N₃ Lymph nodes > 6 cm.
- M₀ No metastasis.
- M₁ Distant metastasis.

Fig. (22)



Spread of the disease:

- 1- **Direct spread.** To the floor of the mouth, mandible. Tumors of the posterior third spread to the tonsils, pharyngeal wall and larynx. → Suffocation
- 2- **Lymphatic spread.** Unlike squamous cell carcinoma of the lip, carcinoma of the tongue disseminates early to the lymph nodes of the neck: لازم
 - i- **Tip:** Spread from the tip of the tongue to the submental lymph nodes then to both submandibular and to both upper deep cervical nodes on both sides.
 - ii- **Anterior 2/3:** Tumors of the lateral third disseminates to the ipsilateral submandibular and then to the upper deep cervical lymph nodes. Those near the midline disseminate bilaterally
 - iii- **Posterior 1/3:** Spread occurs directly to the upper deep cervical lymph nodes.
- 3- **Blood spread.** This is more for tumors of the posterior third.

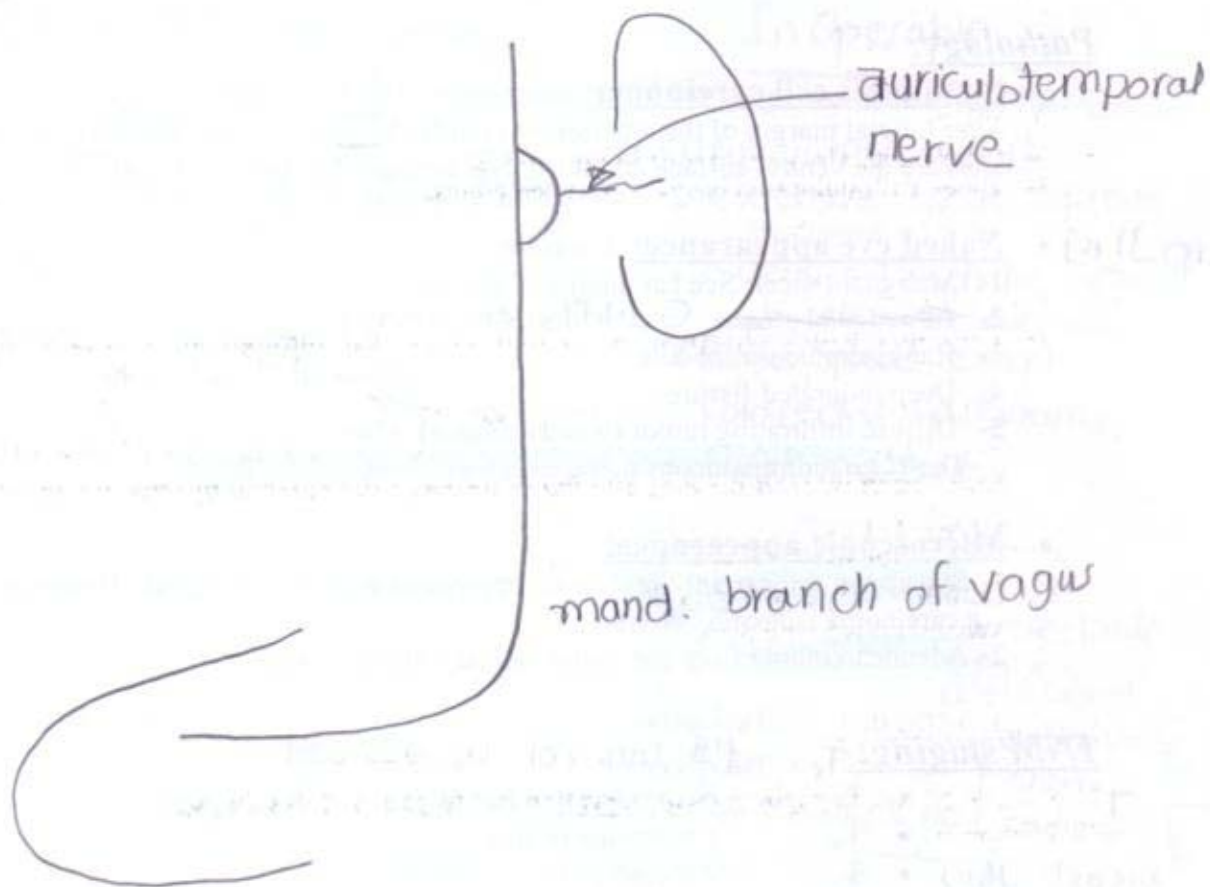
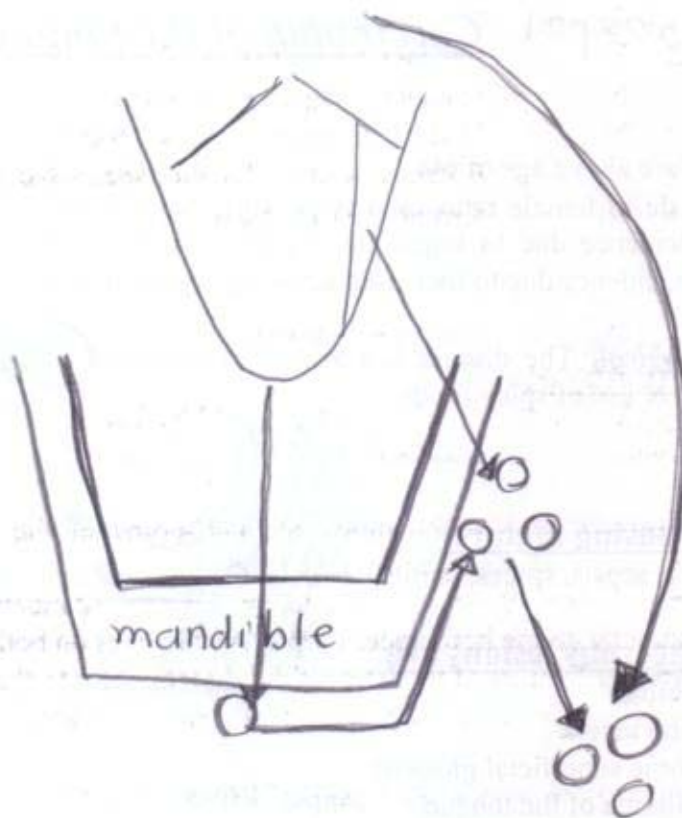
Clinical picture:

- Age: > 60 years.
- Sex: more in males.
- In early cases The patient may complain of:
 - 1- Ulcer with indurated base and everted edges.
 - 2- Deep indurated fissure.
 - 3- Indurated mass.
- Late presentation:
 - 1- Pain in tongue. The pain is referred to the ear through the chorda tympani via the auriculotemporal nerve.
 - 2- Excessive salivation, which may be blood stained.
 - 3- Dysphagia (especially in posterior one third).
 - 4- Feter: Due to necrosis and infection.
 - 5- Inability to speak (dysarthria).
 - 6- Secondaries in the neck.

Complications:

- 1- Inhalation of necrotic tissue leading to bronchopneumonia.
- 2- Combined cancer cachexia and starvation due to pain and dysphagia.
- 3- Hemorrhage.
- 4- Spread.
- 5- Asphyxia may occur.

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Investigations:

- 1- Biopsy from the edge of the ulcer.
- 2- Fine needle aspiration cytology of suspected cervical lymph nodes.
- 3- CT of neck and mandible.

Treatment:

- 1- **Radiotherapy** is indicated in early cases, in tumors of post. 1/3 and in inoperable cases. Irradiation can be performed by iridium needles or by external beam radiotherapy.

SBR

- 2- **Surgical treatment:** For operable cases it is indicated in:

- a. Small suspicious nodule.
- b. Cancer on top of leukoplakia or syphilis.
- c. Tumor infiltrating the mandible (bone).
- d. Recurrence after irradiation.
- e. Resistance to irradiation.

• Surgical removal is as follows:

- 1- For the tip of tongue: V-shaped partial glossectomy is done.
- 2- For margin of the tongue: hemiglossectomy removing one half of the tongue is done.
- 3- Midline and tumors of posterior 1/3: total glossectomy is done removing the whole tongue.
- 4- If the tumor infiltrates the mandible: **Commando operation** is done (combined mandibulectomy and neck dissection operation). Aiming at removing the lesion in continuity with lymphatic drainage. **Preliminary tracheostomy is needed.**

tracheostomy ← upper airways في major surgery اي

- 3- **Treatment of lymph node metastasis:**

- a- If lymph nodes are not enlarged or are enlarged and not fixed: Prophylactic or curative block dissection on one or both sides is done.
- b- If lymph nodes are enlarged and fixed: Palliative deep X-ray therapy is done.

- 4- **Palliation is indicated for:**

- a- Unresectable primary growth.
- b- Fixed lymph nodes in the neck.
- c- Distant metastasis.
- d- unfit for surgery

Methods of palliation are:

- 1- Full dose of therapeutic irradiation is recommended.
- 2- Palliative resection of the primary if possible may comfort the patient.
- 3- Analgesics, nasogastric feeding or tracheostomy may be required.
- 4- Chemotherapy.

Prognosis: (prognostic factors)

- 1- Lymph node involvement is the most important prognostic index.
- 2- TNM staging.
- 3- The degree of tumor differentiation.
- 4- Combined surgery and radiotherapy improve prognosis.
- 5- Prognosis is better in females.

if block Neck dissection to be done
Bilaterally

do [Radical on one Side
[Selective on the other side

Start by Selective

Selectif لوعور internal jugular لاسي الحياة الثانية

If Radcal block Neck dissection BND
is indicated bilaterally

operate on one side (more affected)

→ wait for one month (collaterals)

→ operate on the opposite side



hemiglossectomy

Prognosis

أحسن في الستات Sex

T → Size
→ Site
→ Differentiation

SI

N → Size
→ Number
→ Laterality

M → metastasis

Swellings related to the jaw

- 1- **Epulis** (arising from the gum) as: Fibrous, myeloid, granulomatous, hemangiomas and malignant epulis.
- 2- **Odontomes** (dental origin) as: Dental cyst, dentigerous cyst, and adamantinoma.
- 3- **Bone tumors** as ivory osteoma, osteoclastoma, maxillary antrum carcinoma, fibrosarcoma and osteosarcoma of the mandible.

Epulides

Any swelling situated on the gum, e.g.:

1- Fibrous epulis:

- It is a soft fibroma arising from mucoperiosteum. It is formed of fibrous tissue with spindle cells and plasma cells.
- The swelling is well defined, pedunculated and covered with intact mucous membrane.
- The swelling appears between 2 teeth.
- **Treatment:** Extract a tooth on either side of the tumor and remove wedge of bone with its mucoperiosteum.

2- Granulomatous epulis:

- It consists of excessive granulation tissue in response to chronic irritation either by tooth or irregular denture. The swelling is soft in consistency, bleeds easily on touch, red in color and is not covered by epithelium.
- **Treatment:** Removal of the cause. Cauterization either by diathermy or silver nitrate of this granulation tissue.

3- Hemangiomas epulis:

- Submucous hemangioma of the gum. Blue in color, compressible, sessile, covered with intact mucous membrane. It is liable for severe bleeding.
- **Treatment:** Injection of sclerosing material or surgical excision.

4- Myeloid epulis:

- It is an osteoclastoma arising in the alveolar margin and erupting through a tooth socket.
- It consists of giant cells and spindle cells together with fibroblasts and fibrous tissue.
- Clinically it forms a sessile smooth swelling covered with intact mucous membrane and fixed to underlying bone.
- Adjacent teeth are loosened.
- **Treatment:** Wide excision with the part of the bone carrying the epulis.

5- Carcinomatous epulis.

6- Sarcomatous epulis.

Odontomes

Definition:

- Tumors of the jaw arising from tissues involved in the development of teeth.
- The tooth has two different origins; first ectodermal from the dental plate and secondary from mesodermal origin (**mesodermal papilla**). Between the developing teeth fragments of ectoderm may persist as the paradental debris of Malassez (**this may be responsible for tumor formation later on**).

- Odontomes may arise from ectodermal or mesodermal origin of a tooth or from both. Only those of epithelial origin are common (dental, dentigerous cysts and adamantinoma).

Dental cyst

- Cystic swelling related to the root of a normally erupted tooth (*usually incisor tooth of the upper jaw*). It is due to proliferation of paradental epithelial debris due to chronic irritation by an infected tooth. It is unilocular, slowly growing, lined with epithelium and filled with brownish fluid.
- **Clinically:** It occurs in adult life. The swelling is at first stony hard but later the bone may be thinned out so that "*egg-shell crackling*" can be felt. The tooth related to the swelling is grayish blue in color.
- **Treatment:** Extraction of the affected tooth and excision of the wall of the cyst.



Fig. (23)

Dentigerous cyst

- A cystic swelling related to the root of non-erupted tooth, which is contained into the cyst. It usually affects the third molar tooth. It occurs in young age. It is commoner in the mandible than upper jaw. The mandible is expanded uniformly and sometimes produces eggshell crackling. The cyst grows slowly. It is lined with epithelium and filled with glory fluid around a non-erupted tooth.
- **Treatment:** Remove the roof of the cyst and the lining membrane. If the tooth is normally directed and expected to grow upwards normally it is not removed. If the tooth is maldirected, this tooth is removed.



Fig. (24)

Adamantinoma (Eve's tumor)

- It is a basal cell carcinoma arising from the epithelial debris of Malassez. The tumor arises at the angle of the mandible. It grows slowly forwards into the body of the mandible and upwards into the ascending ramus. It consists of cystic and solid areas separated by fibrous and bony septa. The cystic areas are lined by squamous and basal cells and contain brownish mucoid fluid in the center. The solid areas are composed of fibrous tissue.
- **Clinically:** It is more in females. Age between 25-45 years. Patient presents with a painless lobulated swelling expanding the mandible on the outer side more than the inner. The consistency is bony hard, but eggshell crackling may be elicited.
- **Investigations:**
 - Plain X-ray shows expanding translucent shadow divided by numerous septa into equal lobules (*honey-comb appearance*).
 - CT scan & MRI.
 - Biopsy.



Fig. (25)

- **Complications:**

- Ulceration, infection, bleeding & falling of teeth.
- Pathological fracture (rare).
- It is a locally malignant lesion, so it is liable to recurrence after inappropriate surgery. Sometimes it turns malignant.

- **Treatment:** Resection of tumor bearing segment of the jaw with a healthy margin on either sides. The defect is repaired by bone graft.

Bone tumors

As general

Giant cell lesions of the jaw

1- Giant cell granuloma:

- Affects the lower jaw more commonly. It arises above the symphysis menti as a soft reddish mass and grows backwards in the body of the mandible, but not upwards in the ascending ramus.
- Cut section: Lobulated tumor.
- Histologically, there are giant cells, spindle cells and numerous blood vessels.

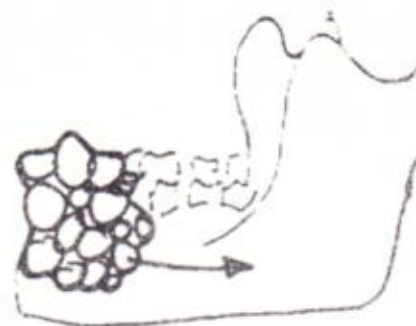


Fig. (26)

Clinical picture:

It is a **painless, slowly growing tumor, expanding the jaw equally on both sides (due to presence of osteoclasts)**. It may show **eggshell crackling**.

Investigations:

Plain X-ray shows expanding translucent shadow with unequal trabeculae (*soap bubble appearance*).

Treatment:

Careful enucleation and gentle curettage. In large tumors, resection of the mandible is done.

2- Osteoclastoma:

It is rare and similar to the previous mentioned lesion, but it is malignant on histological examination.

3- Aneurysmal bone cyst: It forms a soft, sponge like tumor.

Carcinoma of the maxillary antrum

- It is commoner in males.
- **Age:** 40 years.
- The tumor is commonly squamous cell carcinoma or columnar cell carcinoma.
- The effect and clinical presentation depends on which wall of the maxillary antrum is involved.
 - 1- Medial wall causes unilateral nasal obstruction, bleeding from nose and epiphora.
 - 2- Roof of the antrum leads to unilateral proptosis and diplopia.
 - 3- Anterior and lateral walls leads to a swelling in face.
 - 4- Floor, bulges in the roof of the oral cavity and may cause pain referred to the teeth.

- **Treatment:** Either radical surgical excision of the upper jaw or irradiation.

To be "System" or not to be, this is the question.

A. H.	Jaw Swellings		III Bone Swellings	
I Epulides ① Fibrous epulis - Fibroma causing loosening of teeth. - Appears between 2 teeth. - Treat. → Teeth extraction & wedge resection of bone. ② Granulomatous epulis - Due to chronic irritation - Treat. → Curettage ③ Hemangiomas epulis - see later ④ Myeloid epulis Osteoclastoma ⑤ Malignant epulis Squamous cell carcinoma (malignant ulcer)	II Odontomes • May arise from ectodermal or mesodermal origin of tooth or both. • Those of ectodermal origin (Paradental debris of Malassez) are common.			
	A Dental Cyst			
	• origin • etiology • site • age • structure • C/P • X-ray • D.D. • treat.	- Paradental debris of Malassez - Infected tooth - Commonest is Upper incisors - Old age - Wall is lined by epithelium, content is brownish fluid. - Slowly growing swelling, 1st hard then shows egg-shell crackling - Cystic swelling - Other causes of jaw swellings - Extraction of the affected tooth & excision of the wall of the cyst.	B Dentigerous cyst	
	G.R. ما تختصش ولا يمشي أبيد A.H. عند جيل يا خضر يا خضر!! الورقة دي مشكلا مقعد باله أنا لو بيمتن أكون أراكرها. Reham Fouad. 27.4.2002 - System - C/P → وحش. أسد - Fate → هيركب جنت - New in system - C/P → Toxic - Fate → نزل مني		- same - Unerupted tooth - Lower 3rd molar - Younger age - Wall → same content is clear & glory + contains tooth - same - Cystic swelling with tooth inside - Same - Deroofing of the cyst & the lining membrane. Tooth → Normally directed → Not removed → Maldirected → Removed	
	C Adamantinoma		Giant cell granuloma (Benign) osteoclastoma (malignant)	
	• Eve's tumour • Basal cell carcinoma • Paradental debris of Malassez • Angle of the mandible • Outer table more than the inner see later • Multiple cystic swellings • Slowly growing swelling, 1st hard then shows egg-shell crackling • Equal cysts → Honey-comb appearance • Resecton with safety margin + Reconstruction of the mandible using bone graft from the contralateral 5th rib.		- Bone tumour - Symphysis menti - Outer & inner tables - see Later - see Later - same - Unequal cysts → Soap bubble appearance - Same + other option ↓ - Curettage & Radio therapy	

Tongue Ulcers

AH

East or West AH Is The Best Etiology	Traumatic		Inflammatory		Neoplastic (Squamous Cell Carcinoma)	
	Dental Ulcer	Frenular Ulcer	Acute Dyspeptic (Apthus)	TB	Chronic Syphilitic	
Etiology	Sharp teeth	Tongue protrusion in severe cough	Unknown (was wrongly thought upper GIT disturb.)	2ry to open Pulmonary TB	Breakdown of gumma	- Previous irradiation - Marjolin's ulcer - Carcinogenic agents
Number	Single	Single	Multiple	May be multiple	Single	Single
Pain	Painful	Painful	Painful	Severe	Painless	Pain related to the ear
Site	Margin of the tongue	Frinulum (inferior surface of tongue)	Sides, dorsum & inner surface of lip & cheek	Dorsum posteriorly & tip anteriorly	Dorsum in midline	- Lat. margin of ant. 2/3 50% - Posterior 1/3 20%
Size	Usually small	Small	Small	Usually small	Large	Grow rapidly & may reach large size
Shape	Rounded	Rounded or oval	Rounded or oval	Rounded	Rounded	Irregular
Surface	Granulation tissue	Granulation tissue	Covered with white scabs	Pale granulation tissue	Wash-leather (dirty)	Malignant fungating tissue
Margin	Hyperemic	Hyperemic	Hyperemic	Cyanotic		Necrotic tissue
Edge	Sloping	Sloping	Sloping	Undermined & cyanotic	Punched out	Raised everted
Base	Soft	Soft	Soft	Soft	Indurated	Indurated
L.N.	Chronic non-specific	Chronic non-specific	Chronic non-specific	TB lymphadenitis		Metastatic LNs: Hard, progressive and fixed
TTT	Remove septic tooth	ttt of cough	- Gentian violet - Anesthetic gel.	- Anti TB ttt - Oral hygiene	Anti syphilitic drugs	- Surgical removal - Radiotherapy

NB. 1- Chronic Superficial Glossitis : see **AH** notes

2- Acute inflammatory ulcers also includes:

- **Herpetic ulcer** which is multiple, painless, rounded, with hyperemic margin and is caused by herpes simplex virus. It is treated with antiviral drugs.
- **Lichen planus** which is supposed to be due to an autoimmune mechanism. It affects the skin, oral mucosa and may cause ulcers + hyperkeratotic lesions

Salivary:

① written :- * * * * → acute parotitis
→ stones.
→ neoplasms vvv.

② jar :- stone in submand. gland.

③ Operative: drainage parotid abscess.

④ X-ray: stone submandibular gl.

⑤ Clinical:- short }
Long } Kaper

salivary gl.

Major S.G.

- 2 parotid.
- 2 submandibular.
- 2 Sublingual.

Minor S.G.

عدد صغير جداً
في الفم
oral cavity.

Salivary glands

Non-Neoplastic Salivary Gland Diseases

This term includes different disease groups, which are:

~~1- Congenital diseases, as ectopic parotid tissue, cystic hygroma & sialectasis.~~

2- Infections:

- a. Acute: viral, bacterial.
- b. Recurrent subacute or chronic.
- c. Rare: T.B.

3- Salivary stones.

~~4- Salivary fistula.~~

5- Degenerative diseases (sialectasis).

6- Autoimmune salivary diseases

7- Drug-induced enlargement of the salivary glands has been reported e.g. iodide containing compounds, Thiouracil, hypotensive drugs & contraceptive pills.

8- Metabolic & endocrinal causes include liver cirrhosis, diabetes mellitus, alcoholism & malnutrition.

Sialectasis

(Degenerative disease)

Definition: Sialectasis means abnormal dilatation of the small branches of the salivary ducts.

Etiology: Not known, but the childhood type is known to be a familial disease.

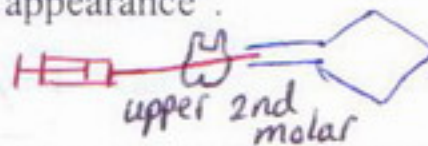
Clinical picture: The usual presentation is recurrent attacks of sialadenitis.

→ Enlargement
→ Recurrent infections

Investigations: Sialography "snow storm appearance".

بشكل لجنة سفوي

Lipidol dye



snow storm appearance

Treatment:

- 1- Conservative: Stimulate salivary flow and massage the affected gland with antibiotics during attacks of inflammation.
- 2- Surgical excision of the gland. لومضات

Autoimmune salivary diseases

1- Mikulicz's disease: Consists of enlargement of the salivary and the lacrimal glands and dryness of the mouth.

2- Sjogren's disease

a. Primary Sjogren's disease consists of dryness of the mouth (xerostomia) and dryness of the eye (keratoconjunctivitis sicca).

b. Secondary Sjogren's disease as well as rheumatoid arthritis, salivary gland discomfort, but only 30 % have sialomegaly.

Complications:

Patients with Sjogren's disease are 44 times prone to the development of lymphoma than the general population.

سؤال شفوي مهم:

sites of stones:-

1. Urinary tract

→ 90% radiopaque

2. Biliary tract.

→ 10% radio-opaque

3. Salivary glands

→ 100% radiopaque

4. Pancreas

5. Prostate

6. Umbilicus (dirts).

7. Intestine (gall stone
ileus).

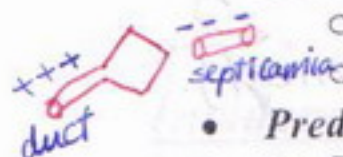
Operative (drainage) + معمل نظري Acute parotitis

Definition:

Acute inflammation of the parotid gland.

Etiology:

- **Causative agent:** pyogenic organisms usually staph. Aureus
- **Route of infection:**
 - Retrograde infection from the mouth through the duct.
 - Blood born infection.



- **Predisposing factors:**

- 1- Dehydration. → **viscid secretion** (سليم)
- 2- Debilitating medical diseases as typhoid and cholera (dry infected mouth).
- 3- Obstruction of the parotid duct.
- 4- As a complication of septicemia.

Fig. (27)



Incision in the caps

Skin incision

Pathology:

As the inflammatory process proceeds, the resultant edema and exudate will increase the tension inside the closed space formed by the parotid capsule and fascia.

→ **toxaemia** (سُم)
→ **severe pain**

Clinical picture:

- 1- Severe toxemia.
- 2- A painful swelling on the side of the face. Edema appears early and fluctuation appears later.
- 3- Pus can be expressed from the duct of the gland in the oral cavity.

شدة
fascia

Treatment: as breast abscess +

- 1- **Prophylactic**, correct dehydration, and care for oral hygiene.
- 2- **Early cases** respond to antibiotic therapy.
- 3- **In fulminating cases:** Early decompression of the gland is needed (even before appearance of fluctuation). A curved skin incision is done following the angle of the mandible. The skin flap is reflected. The capsule of the parotid is opened transversely by **Hilton's method** (this avoids injury of facial nerve).

under
general
anesth.

X-ray معمل نظري Salivary calculi

Incidence:

Stone may occur in the parotid gland, which is very rare, but commonly occurs in the submandibular gland because:

- 1- The parotid secretion is watery while the submandibular secretion is viscid.
- 2- Drainage of the parotid gland is free, while the submandibular duct ascends upwards towards the floor of the mouth making drainage inadequate.
- 3- Foreign particles are liable to lodge in the submandibular duct.

Pathology:

The stone may be single or multiple occurring in the duct or in substance of the gland. The stone is formed of calcium and magnesium phosphate and carbonate (radio-opaque).

Metabolic disturbance
Why?
infection
stasis

Clinical picture: معمل في بقة يسوع في ودينه

- 1- Attacks of pain and swelling in the region of the submandibular gland during meals. Pain is colicky in nature and may be referred to the ear.
- 2- On examination the gland is enlarged and tender. Stone in the duct can be felt or even seen in the floor of the mouth.

- 3- The duct opening is congested and pus may be expressed from it.
- 4- X-ray shows the stone, as it is radio-opaque.

Treatment:

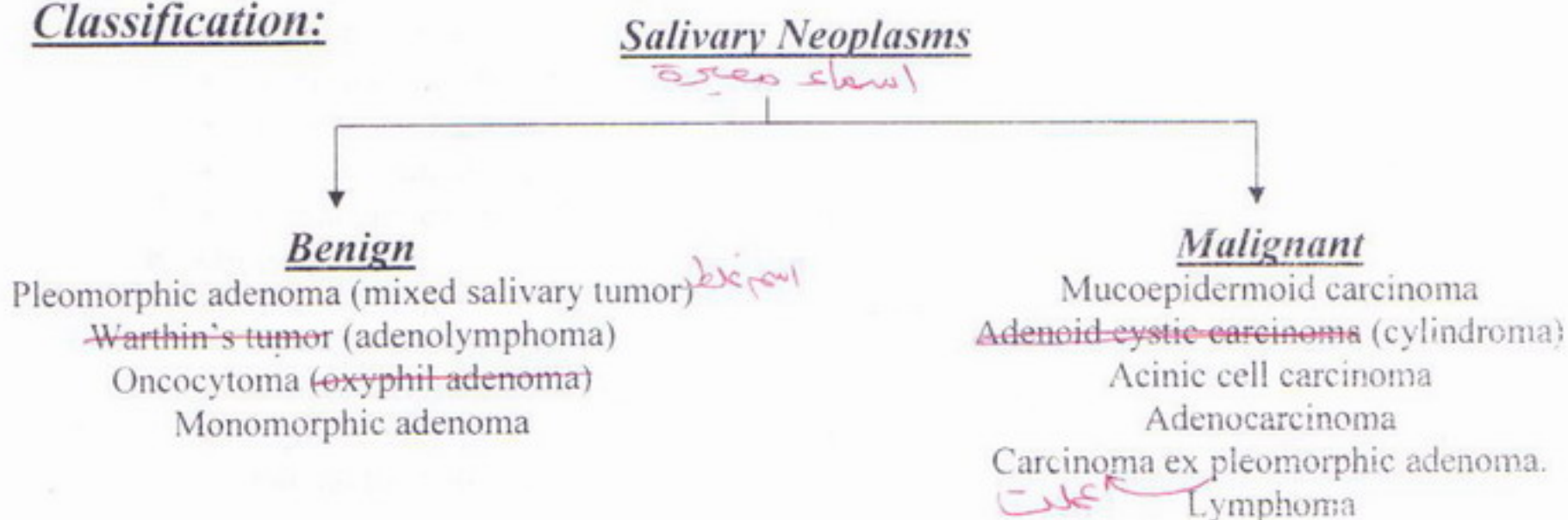
- 1- Stone at orifice is removed through meatotomy.
- 2- Stone in the duct is removed by cutting directly over it. → * mm of mouth floor.
- 3- Stones in the gland are treated by total excision of the gland (sialadenectomy).

Salivary Neoplasms

Incidence:

Salivary neoplasms constitute 5 % of head and neck tumors. The majority of these neoplasms are benign and most commonly arises in the parotid gland.

Classification:



Hemangiomas & lymphangiomas may affect the parotid, but these are pathologically hamartomas rather than true neoplasms.

Pathology of benign salivary neoplasm:

1- Pleomorphic adenoma (Mixed parotid tumor):

The commonest tumor of salivary glands. It occurs in the fourth decade of life, but any age and any sex may be affected.

Pathology:

- It is a pleomorphic adenoma; epithelial cells arranged in sheets, duct like structures, mucoid material (thought to be cartilaginous).
- The tumor is apparently well encapsulated, but the capsule is incomplete (this explain the frequency of recurrence after enucleation).

2- Adenolymphoma = Warthin's tumor:

- It is an epithelial tumor arising within a parotid lymph node. Macroscopically multiple cysts of variable sizes are seen. Microscopically: epithelial lined spaces in lymphoid stroma.

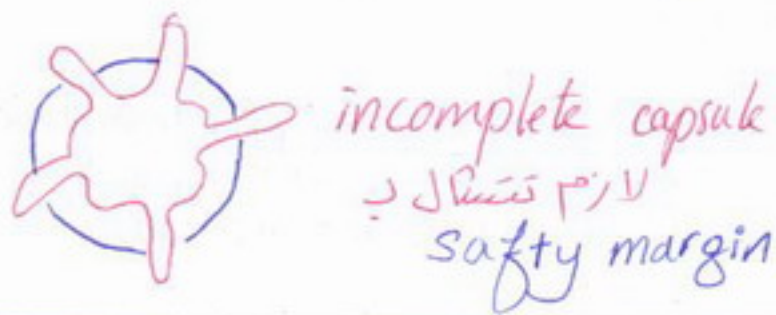
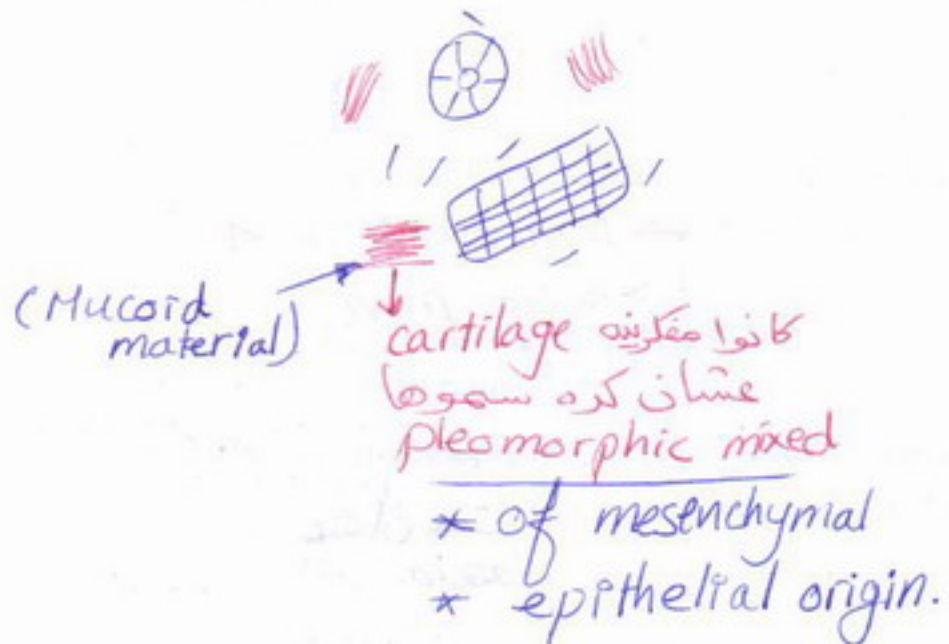
Pathology of carcinoma of salivary glands:

It occurs in elderly age, commoner in females. It may start de-novo or on top of a mixed salivary tumor.

- 1- Mucoepidermoid carcinoma arises from the duct epithelium and is the commonest member of the group. It usually affects the parotid. Three grades are described; low grade, intermediate grade, or high-grade tumors. The low-grade type is the most frequent and is known to affect children.

Benign

1. Pleomorphic adenoma
(Mixed salivary neoplasm)
+++ commonest



2. Adenolymphoma
epithelial cells in lymphoid stroma.
→ ectopic salivary within LN.
→ ectopic lymph. within salivary.
cystic.

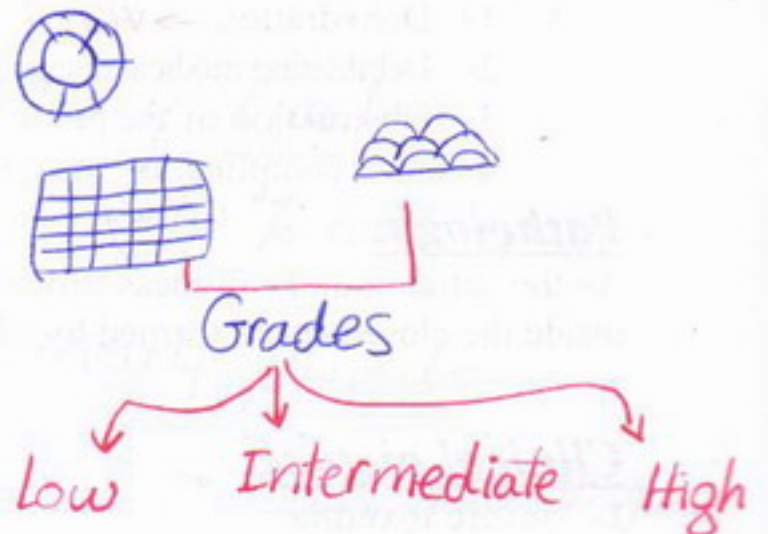


3. Onchocytoma

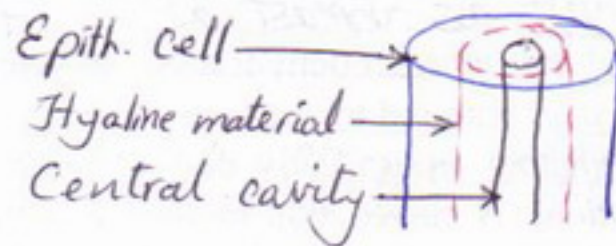
4. Monomorphic adenoma
adenoma یکنواخت

Malignant

1. Mucoepidermoid
from duct (commonest).



2. Cylindroma



3. acinic

4. adenocarcinoma
5. Lymphoma

- 2- Adenoid cystic carcinoma (cylindroma): Histologically alternating layers of cylinders of cells and hyaline material are arranged around a central cavity forming cylindroma. It is the commonest tumor of minor salivary glands.
- 3- Acinic cell carcinoma: The cells of this uncommon tumor resemble the acinic cells of the parotid gland. ~~They may metastasize to local lymph nodes or distant sites.~~

X Miscellaneous adenocarcinomas: They vary according to their histologic pattern. They may be trabecular, anaplastic, mucous carcinomas. They are highly malignant.

Clinical picture of benign salivary neoplasm:

Symptoms:

Painless, slowly growing swelling in the parotid region.

Signs:

■ Inspection shows a

- swelling over the angle of the mandible
- Elevate the lobule of the ear.
- The swelling is superficial to masseter muscle
- Facial nerve is not affected by the tumor.

■ On palpation:

- The swelling is not hot, not tender, not attached to the skin, masseter or bone. The swelling is well defined. Consistency varies from firm to cystic (but never hard).
- **Pulsation** of the superficial temporal artery is felt normal.
- Tumors arising in the deeper part of the parotid may bulge in the oropharynx behind the tonsil, hence the importance of examining the mouth cavity.

Clinical picture of carcinoma of the parotid:

- The tumor forms a **rapidly growing swelling, hard** in consistency, **ill defined and nodular**.
- It becomes **fixed to skin and deeper structures**.
- **Local pain**, which may be referred to the ear.
- Facial palsy and lymph node enlargement.
- **Loss of superficial temporal pulse.**

Differential diagnosis:

1- Extra parotid swellings:

- Lymph nodes (parotid or upper deep cervical), sebaceous cyst & lipomas may resemble pleomorphic adenomas.
- Mandibular, maxillary & infratemporal fossa tumors may produce the false appearance of a parotid enlargement.
- Hypertrophy of the masseter: The condition is sometimes so difficult to differentiate from a true parotid enlargement.

- 2- True parotid enlargement that is caused by non-neoplastic salivary gland disease. The gland is diffusely enlarged with no definite lump.

Investigations: (not routine as in most cases clinical diagnosis is enough to proceed to treatment)

- 1- **Biopsy**: FNAC is allowed. (Reliable investigation which needs expert cytologist)
- 2- **CT-scan**: to show extent of the tumor.
- 3- Salivary neoplasm shows as a cold spot on **isotope scanning with technetium**. Adenolymphoma and oncocytoma show as hot spots.

Hot spot الوحيد

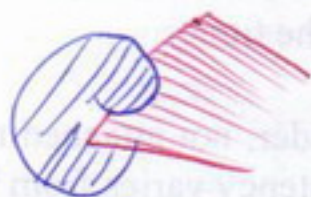
oral:

ليه الـ g submandib.

مكن تحس من الـ

oral cavity?

as the deep part of the
submandibular gland
is above the myelohyoid
muscle



Clinical picture of carcinoma of the parotid:

- The tumor forms a rapidly growing swelling, hard in consistency, ill defined and nodular.
- It becomes fixed to skin and deeper structures.
- Local pain, which may be referred to the ear.
- Facial palsy and lymph node enlargement.
- Loss of superficial temporal pulse.

Differential diagnosis:

Extra parotid swellings:

- Lymph nodes (parotid or a part of deep cervical), sebaceous cysts, lipomas, etc.
- Pleomorphic adenoma.
- Mandibular, maxillary & infratemporal fossa tumors may produce the same appearance.
- Parotid enlargement.
- Hypertrophy of the masseter. The condition is sometimes so difficult to differentiate from true parotid enlargement.

2- The parotid enlargement that is caused by non-neoplastic salivary gland disease. These are is diffusely enlarged with no definite lump.

Investigation: (not routine as in most cases clinical features is enough to proceed to treatment)

- 1- Biopsy: FNAC is allowed (flexible invasive).
- 2- CT scan: to show extent of the tumor.
- 3- Salivary neoplasms show as a cold.
- 4- Adenocarcinoma and oncocytoma show

Hot spot: Oncology

Treatment:Tumors that are clinically benign:

- Enucleation of a pleomorphic adenoma is easy, but is followed by recurrence that is caused by the left tumor extensions through the defective capsule. The tumor should therefore, be excised with a safety margin.
- The standard operation is "superficial parotidectomy". Early in the operation the facial nerve trunk is exposed. All the parotid tissue that is superficial to the nerve and its branches is excised, taking great care not to injure them.
- Tumors arising in the deep part of the gland are treated by "total conservative parotidectomy" i.e. excising the whole gland while preserving the facial nerve.
- Benign tumors of the submandibular gland are treated by "submandibular sialoadenectomy".

Tumors that are clinically malignant:

- If a pathological diagnosis has not been obtained prior to the operation, **frozen section** examination during surgery is helpful.
- The standard treatment is radical excision, which includes wide surgical clearance with cervical lymph node dissection if they were enlarged. For the parotid, this usually necessitates excision of the facial nerve, and probably part of the masseter or the mandible. = e safety margin
- Radiotherapy is of limited value, but is administered as a postoperative adjuvant therapy for tumors of high-grade malignancy.

لاستكمال الشكل

Swellings in the submandibular region

- A- Skin & S.C.: As before. below ↓
- B- Submandibular L.N.s.: Multiple, can be rolled over the lower border of mandible & only felt toward the skin.
- C- Submandibular salivary gland: Single, cannot be rolled over lower border of mandible & felt in the floor of mouth.
- D- Mandible.
- E- Muscle.
- F- Artery: Aneurysm of facial artery.
- G- Nerve: neurofibroma.

من في كتاب القسم

Swellings in the parotid region

- Skin & S.C.:
 - 1) Preauricular dermoid cyst.
 - 2) Hemangioma.
 - 3) **Melanoma.**
 - 4) Lipoma.
 - 5) Papilloma.
- Preauricular L.N.s. lymphadenopathy ← B M inflam.
- Parotid salivary gland:
 - 1) Inflammation: Mumps, suppurative parotitis, endemic parotitis.
 - 2) Sialectasis.
 - 3) Stones.
 - 4) Tumors.
- Masseter: (become fixed on muscle contraction) e.g. Fibrosarcoma or hypertrophy.
- Mandible.
- Artery: Aneurysm of superficial temporal artery.
- Nerve: neurofibroma

من في كتاب القسم

* Written :

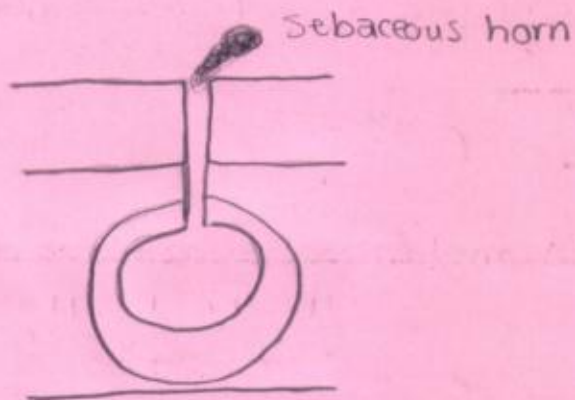
- 1- Basal cell carcinoma
 - 2- Squamous cell carcinoma
 - 3- Melanoma
 - 4- Hemangioma
- الأمم }

* Clinical :

Lipoma
Sebaceous cyst
Basal cell carcinoma
Squamous cell carcinoma

* No X ray or Operative or Anatomy

* Jar : Squamous cell carcinoma



Skin & subcutaneous tissues

شفاوی مهم / نظری مستبعد Sebaceous (epidermoid) cyst

* Definition:

A sebaceous cyst is a retention cyst due to blockage of the duct of a sebaceous gland.

* Structure:

It is lined by stratified squamous epithelium and contains a foul smelling, white material composed of keratin, epithelial cells and granular debris. بقایا ال دال المیتة

* Clinical features:

- 1- **Age:** Slowly growing and are, therefore, rarely seen before adolescence.
- 2- **Site:** Most commonly in the scalp, face, neck or scrotum but they can occur anywhere except the palm of the foot, which are devoid of sebaceous glands.
- 3- **On examination:** Small (less commonly large), well defined, cystic swelling which is usually attached to the skin at one point, which is the site of the duct. A punctum may be seen.

Sebaceous cyst ممشیش طفل عنده



Fig. (28)

حان مرة قبل كده

* Complications:

- 1- **Infection:** It may subside by antibiotics, otherwise if an abscess forms, it should be drained and the wall of the cyst excised.
- 2- **Sebaceous horn:** The contents of the cyst may come out slowly and become inspissated in successive layers over the base.
- 3- **Ulceration:** An infected cyst may undergo ulceration leading to the appearance of an ulcer with raised edges. This ulcer is called "Cock's peculiar tumor" and it may be mistaken for a carcinoma, but it lacks the induration of malignant lesions. If in doubt a biopsy should be taken.
- 4- **Localized alopecia:** موتة الی الی hair follicles
- 5- **Carcinoma (Squamous - basal cell carcinoma)**

* Treatment:

Complete excision of the cyst with an ellipse of overlying skin containing the punctum. The operation can be done under local anesthesia if the cyst is small.



شفاوی / Clinical Dermoid cyst

* Structure:

This is a cyst lined by stratified squamous epithelium and contains sebaceous material. Sometimes hair or sebaceous glands may grow from the wall of the cyst.

مهم جدا Types:

1- Sequestration dermoid:

- Due to subcutaneous inclusion of portions of the surface epithelium along the lines of fusion of cutaneous segments during fetal life. They may not appear clinically except after few years when the cyst begins to distend.

استمر في النمو من غير ما يقف بعدما قابل



Fig. (29)

- **Sites:** e.g. external angular dermoids at the outer angle of the eye, at the root of the nose, around the ear or along the midline of the body.

المكان الوحيد الی مفهوش Limbs ← Dermoid Cyst

139 Grow by budding ← no fusion of dermatomes

⊗ Hamartoma :

Tumor like condition formed of tissues that are normally present at this site but hazardedly arranged

Clinically: benign neoplasm

well defined - slowly growing - Rounded.
Present since birth - grow at the same rate of normal tissues

e.g. Hemangioma - Lymangioma

- **On examination:** A well-defined, globular, cystic swelling, which is not attached to the skin. The underlying bone may be hollowed out and there may be a pedicle connecting the deep aspect of the cyst to the dura matter.

depression ← bone على ال Pressure يعمل



المثال الوحيد

2- **Tubulodermoids:**

- Due to distension of remnants of embryonic ducts such as **branchial cyst**.

Sequestration

3- **Inclusion dermoids:**

- Due to inclusion of the epidermis during closure of a cavity. e.g. **oral cavity**.
- Site: **Sublingual**.

4- **Teratomatous dermoid:** **ovary** الى خذنا هافال

- These are benign forms of teratomas.
- **Structure:** The cyst is lined by squamous epithelium but contains teeth, hairs, bone, cartilage or glands.
- **Site:** Mostly in the **ovary** but are occasionally found in the **testis** or **posterior mediastinum**.

5- **Implantation dermoids:**

- Due to puncture wounds which displace some epithelial cells into the subcutaneous tissues. The displaced cells retain their viability and form a dermoid cyst.
- **Site:** mainly in the **fingers, palm or sole**. at the site of **improperly managed wound**

حثة epidermis دخلت وانتقل عليها

مسماري الجرحه قردى

Treatment:

The only way of treatment is by **surgical excision**. صعبة

NB:

- 1- In children with a dermoid cyst in the scalp it is better to wait until closure of the skull sutures because some cysts may communicate with the dura.
- 2- Surgery for a dermoid cyst is more difficult than that for a sebaceous cyst, because a dermoid cyst is deeper

Hemangioma عجنمل نظري (مباش قبل كده)

ورم دموى

- A hemangioma is a **hamartoma** rather than a true tumor.

Types:

1- **Capillary hemangioma:**

- The commonest variety, may present as:

A- **Strawberry angioma:**

- 1- **On examination:** The lesion is red in color and slightly raised above the surface.
- 2- **Site:** The commonest site is the **face** and the **head**.
- 3- **Natural history:** After the **age** of one year the lesion starts to undergo involution. Eventually the color fades and flattening occurs so that there may be complete involution at the age of **7 to 8** years. This course is not predictable and sometimes, the lesion continues to grow.
- 4- **Complications:** The only danger of this lesion is the **liability to bleeding** if the angioma is in an area liable to friction and ulceration.

قصبة: فارس

* لو كبرت تجيبوها الى

متفلقش منه

5- **Treatment:** Indications for intervention → ↑↑ in size

- a- Better left for spontaneous involution.
 - b- If problems occur: Surgery or laser therapies are performed. A course of corticosteroid therapy may help the involution of the lesion.
- Liable to trauma
→ Functional disability جنبهين

ليلا على خفي

B- **Port wine stain** (nevus flammarum) → Flat

- 1- **On examination:** The lesion is dark purple in color and is not raised above the surface. Pressure causes blanching but the color returns immediately after release of pressure.

D.D. from melanocytic lesions

- 2- **Site:** May take the distribution of one of the branches of the trigeminal nerve, but the lesion does not cross the midline. Sometimes, a port wine stain of the face is associated with similar lesions in the meninges (**Sturge-Weber syndrome**)

intracranial hemangioma →

لو حاله عيان عنده hemangioma في ال face ؟ C.T

- 3- **Natural history:** This lesion is present since birth and it does not undergo involution.

4- **Treatment:**

- a- Laser ablation.
- b- Surgery and grafting may be difficult as the lesion may involve a large area of the face.

C- **Spider nevi:** Liver cell failure

These lesions may arise in patients with liver cirrhosis & are supposed to be due to hyperestrinism. The lesion consists of a small tiny arteriole from which radiate multiple capillaries.

D- **Hereditary hemorrhagic telangiectasia:**

~~There are multiple small angiomas in the skin and mucosa with a strong tendency to hemorrhage.~~ Hereditary disease resulting in abnormal dilatation of capillaries & characterized by bleeding tendency

2- **Cavernous hemangioma** + Vein S.C. Submucosal

■ Less common than capillary hemangioma.

- 1- **On examination:** Presents as a compressible swelling with some discoloration of the overlying skin.
- 2- **Site:** Occur in the subcutaneous tissue or the submucous lining of the cheek, lips or tongue. It may involve the internal organs as the liver. → Cavernous احباتك لازم
- 3- **Natural history:** The lesion is present since birth and it has no tendency to involution.
- 4- **Complications:**
 - a- It may lead to thrombocytopenic purpura due to sequestration of a large number of platelets.
 - b- Atrophy of the overlying skin may lead to severe hemorrhage. ulceration &
 - c- Septicemia from invasion by microorganisms.

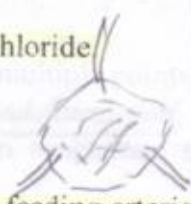
5- **Treatment:**

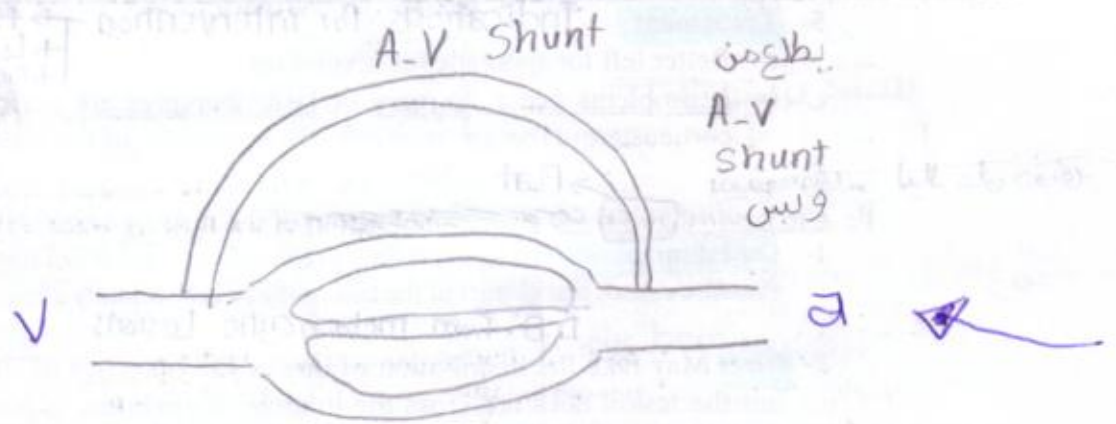
- i. Laser therapy. ندوس على طرف الزقوم
- ii. Injection of sclerosing solutions as 20 % sodium chloride
- iii. Surgical excision.

ما لاوزي التبايق

3- **Arterial angioma: (cirsoid aneurysm)**

- 1- **Nature:** This lesion is a sort of venous plexus with multiple feeding arteries and so; it is a sort of an arterio-venous fistula.
- 2- **On examination:** The lesion appears as soft, compressible and pulsating swelling with a marked bruit.

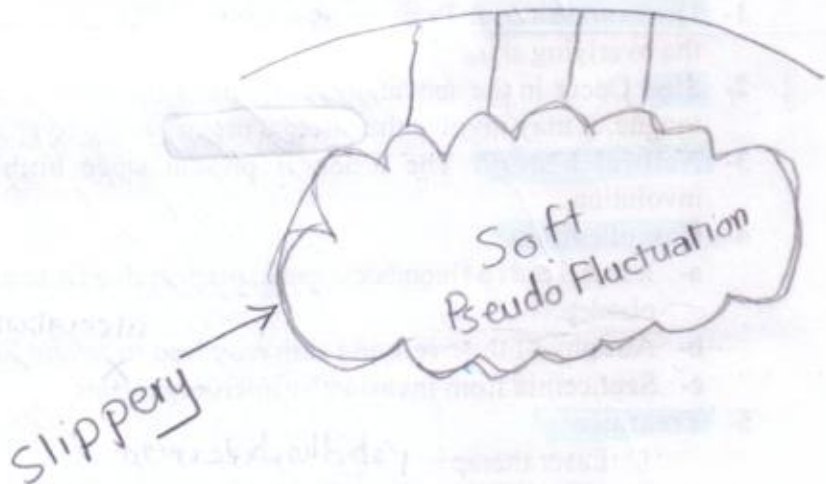




Well defined edges:

2 types

- Fixed
- Slippery



- 3- **Site:** It occurs most commonly in the scalp especially in the temporal or occipital regions.
- 4- **Complications:** Ulceration of the overlying skin may lead to serious hemorrhage, as the bleeding is arterial.
- 5- **Treatment:** Difficult as the swelling is supplied by multiple feeding arteries which have to be ligated. Preliminary embolization of the feeding vessels may be tried.

4- **Glomus tumor (angioneuromyoma):**

True tumor arising from A-V shunts (glomera) in the distal extremities. It is composed of vascular, neural and smooth muscle fibers. It causes severe paroxysmal pain induced by pressure or temperature changes. It appears as tender purple spot under the nail. Treatment is by excision.

جری عروق الجراحی اینوم یسوا آی Benign tumors ← کیس دهنی

Lipoma مهم جدا جدا جراحی شقی

Universal tumor

تحت فم ای حته لافا Brain

Adipose tissue لافا مفیوش

Definition: Benign tumor of the fatty tissue.

Incidence: Common in adult, single or multiple.

Classification:

I) **According to composition:**

1- **Ordinary lipoma:** Mainly fat with little fibrous tissue. Soft.

2- **Fibrolipoma:** Contains excess fibrous tissue rendering it firm.

3- **Angiolipoma:** Contains angiomatous tissue rendering it bluish.

4- **Myxolipoma:** Contains myxomatous tissue.

degenerated fibrous tissue

partially compressible
while Hemangioma
is compressible

II) **According to presentation:** Lipomas may present as:

1- **A solitary swelling.**

2- **Multiple lipomatosis** in which the limbs or the trunk are the seat of multiple lipomas (differential diagnosis of multiple swellings).

3- **Diffuse lipomatous deposits.** These can occur in certain areas, e.g. patients with myxedema have supraclavicular fatty deposits, elderly persons may develop lipomatous deposits below the chin and sometimes females may develop painful fatty deposits in the thigh (**Dercum's disease**).

reassurance & Analgesics هتشیلایه ولایه ؟؟

III) **According to the site of origin:** solitary lipomas are classified into:

1- **Subcutaneous lipomata:** These are the commonest and they have the following characters:

a. Slowly growing tumor in the subcutaneous tissue.

b. The tumor is painless and is not tender.

c. **Lobulated surface**, which may be attached to the skin at multiple points.

d. The consistency is soft, although some lipomata may give pseudofluctuation; this is due to mobility of the tumor in its bed and because fat at warm temperature may undergo liquefaction.

e. It has a well-defined slippery edge due to movement of the tumor inside its capsule.

f. The swelling is mobile over deep structures.

2- **Subfascial lipomata:** Occur under the deep fascia.

no slippery edge - no Lobulated surface تعرفها ازای ؟؟ شقی

حسیت
Fluctuant swelling
تفتح نفاقها
Lipoma
examination
اوبال
other
signs
of
Lipoma

شفوی : هر ممکن Lipoma تقویت عیان ؟؟

1- Submucous lipoma in the intestine

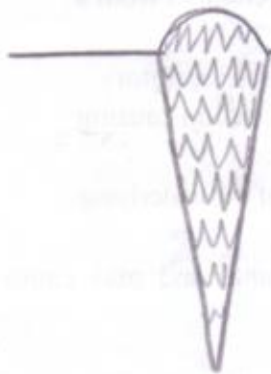
→ intussusception → obstruction

2 - Submucous Lipoma in the Larynx

→ respiratory obstruction

تشیخ

Hypertrophic scar



Keloid



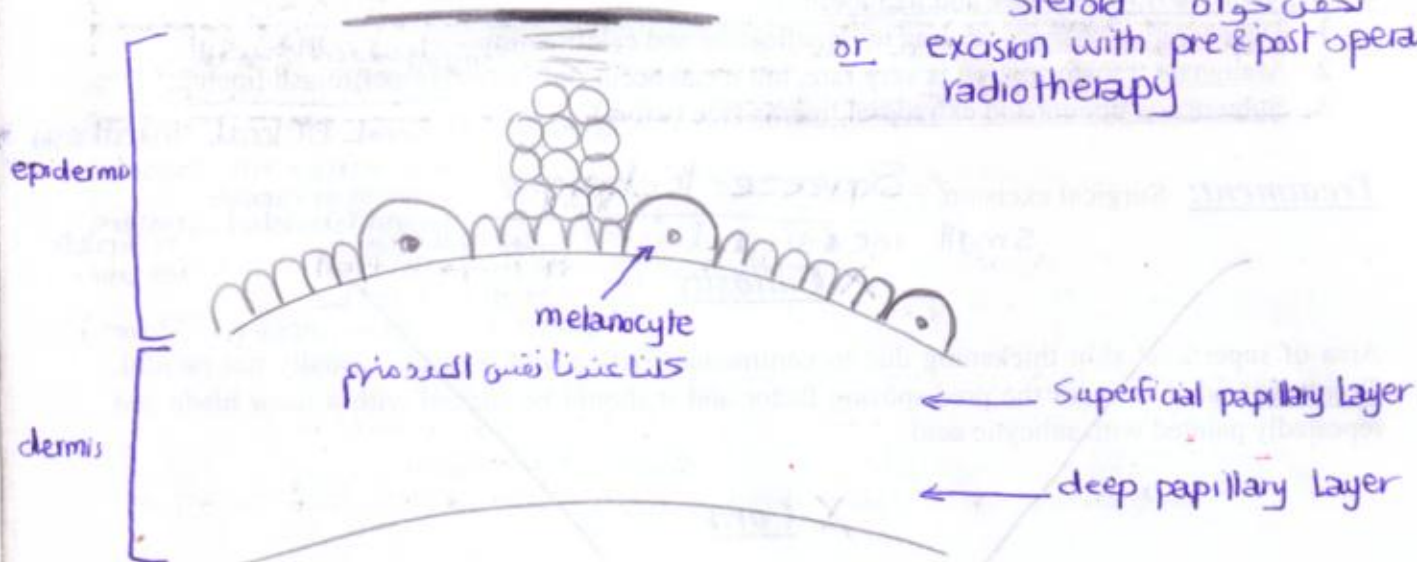
no maturation of collagen

حسب ما يزعمه
Collagenoma

مميّزة لوعملته
excision وقطعت الجرح هيرجع أكبر من الأول
لأنك علت جرح أكبر من الأول

عشان كده تعمل
excision within Keloid

تحقن جواه
Steroid
or excision with pre & post operative
radiotherapy



Precancerous			
Lentigo	Junctional pigmented nevus	intradermal pigmented nevus	Compound pigmented nevus
Flat	Flat (لأه)	raised Commonest	raised e.g. Giant hairy nevus

Keloid

- A rare condition, commonly over the sternum.
- There is inhibition in maturation and stabilization of collagen fibers.
- The same picture as hypertrophic scar but keloid may spread among nearby healthy tissues and continues to get worsen even after years.
- High rate of recurrence after excision or X-ray therapy.
- **Management:**
 - 1) Shaving of excess tissue then resurfacing by thin skin graft.
 - 2) Steroid injection.

(2) excision with pre & post operative radiotherapy

	<u>Hypertrophic scar</u>	<u>Keloid</u>
Definition	<u>Delayed</u> maturation of collagen fibers in a wound.	<u>Failure</u> of maturation of collagen fibers in a wound
Induration	<u>Limited</u> to the scar	<u>Extends</u> beyond the scar
Course	<u>Stationary</u> after 6 months	<u>Progressive</u> even after 6 months

Management: Excision + plastic repair

Shaving of excess tissue then resurfacing by thin skin graft

Melanocytic Tumors2- Steroid injection
3- Excision with pre & post operative radiotherapy

- Melanocytes lodge in between the basal cells of the epidermis. Various hamartomas or true tumors can arise from the melanocytes.

Benign lesions of melanocytes:

- 1- **Lentigo:** Melanocytes replace the basal layer of the epidermis over a certain area.
Clinically it appears as a spot varying in color from pale brown to black.
- 2- **Junctional-pigmented nevus:** More proliferation of melanocytes at the junction of epidermis and dermis.
Clinically: Looks like a lentigo.
- 3- **Compound pigmented nevus:**
Some melanocytes pass to the dermis. These melanocytes lose their capacity to form melanin and they are called nevus cells.
Clinically:
 - Lesions are raised above the surface and vary in color from pale brown to black.
 - Sometimes dark hairs are seen growing from the surface of the lesion. Rarely, an extensive area of the skin is replaced by such hairy-pigmented nevus (**giant hair nevus**).
- 4- **Intradermal pigmented nevus:** (the commonest). *Clinically* they look like compound pigmented nevus.

Can pigmented nevi turn malignant?

- 1- The giant hairy-pigmented nevi can give rise to metastases.
- 2- After puberty any pigmented nevus with junctional activity has the potential to undergo malignant changes, but this is rare.

Indications for surgical excision:

- 1- For cosmetic reasons. ← في مناخيرها
- 2- If they are subjected to repeated trauma e.g. during shaving.
- 3- If there is suspicion of malignant transformation.

~~Adequate surgical excision should be performed and the specimen should be examined histologically.~~

Precancerous skin lesions

Squamous keratosis (actinic or senile):

Present by dry, rough, inelastic and irregular pigmented areas of skin with hyperkeratosis. It is the most important precursor of squamous cell carcinoma.

Bowen's disease:

Arises in non exposed skin with sharply demarcated, rounded reddish patches which enlarge slowly with marked cellular hyperplasia.

نظري مهم Melanoma

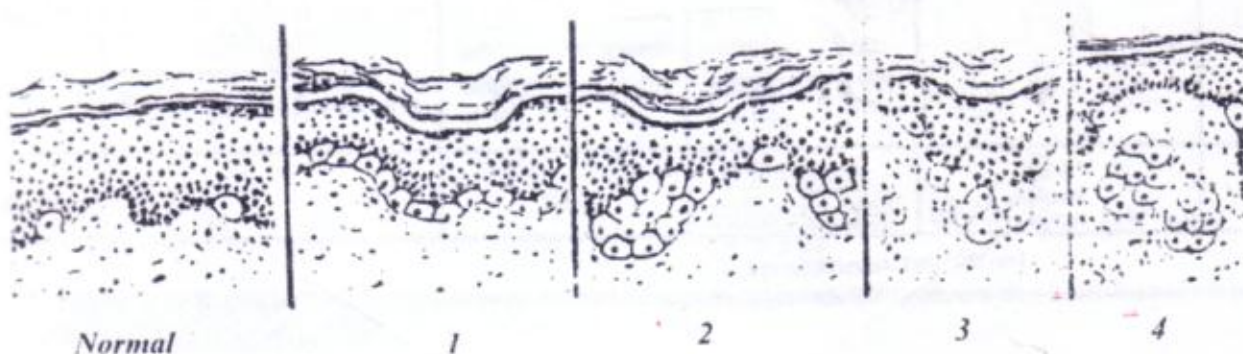


Fig. (30)

* Incidence: خرم الأوزون

- In Western countries the incidence of malignant melanoma is increasing, which may be due to defective ozone layer. Malignant melanoma is almost unknown before puberty.

* Etiology: S.S.S. جمعية

- 1- Prolonged exposure to ultraviolet rays of the sun.
- 2- Albinism and xeroderma pigmentosa. no protection from sunrays
- 3- On top of a benign nevus (discuss).
 ↳ giant hairy pigmented nevus
 ↳ junctional activity

Sun ray
Skin disease
Simple tumor (Lesion)

Criteria of malignant transformation of a benign nevus:

- 1- Increase size or volume of the tumor.
- 2- Increased pigmentation or depigmentation.
- 3- Ulceration and bleeding.
- 4- Pain.
- 5- Induration.
- 6- Surrounded by halo of pigmentation or multiple satellites.



* قانون

في كل Skin lesions

ال Gross picture ال Clinical picture



* 2.2.2. 2.2.2. 2.2.2.

Simple tumor (lesion) Skin disease 2 in 1



Pathology and clinical types: A.H. جدول

نظيها أسود ولا سفة فستان أبيض
(تشخيصها صعب)
أرجو تنكيرة

	Superficial spreading melanoma	Nodular melanoma	Lentigo melanoma	Acral lentiginous melanoma	Amelanotic melanoma
Incidence	Commonest 64%	Less common 12-25%	Less common 1-15%	Rare	Rare
Site	In any part of the body.	In any part of the body.	Usually in the face.	In the palms and soles. It may occur beneath the nail.	In any part
breast Carcinoma Age	Usually in commonest middle age.	In younger age groups.	Elderly persons.		
عومها في Paragraph واحد Clinically	① Raised above the surface and it has an irregular edge. ② ③ Irregular surface	The lesion is raised above the surface its color is gray or black, has a smooth surface & is liable to ulceration. ④ ⑤	It begins as a flat brown macule which grows very slowly. Some areas may even regress.		
Prognosis		Bad	The least malignant type.	Bad Poor. في Sole عرض تشوفا	Very Bad poor

- Malignant melanoma may rarely arise in the eye, in the meninges, or at the mucocutaneous junction as the anal canal.

Factors, which have a major influence on the prognosis, are:

- 1- The thickness of the tumor (**Breslow classification**). → خافق على البيئة
- 2- The depth of invasion of the skin (**Clark's level of invasion**) as follows:
 - a- Epidermis.
 - b- Dermo-epidermal junction.
 - c- Superficial papillary dermis.
 - d- Deep papillary dermis.
 - e- Subcutaneous tissue.

جرمعي .. تباع جلود
بجلمكافح .. بدأمن الصفر
الحزمة بـ ٢٧ جنبه من غير رباط
الرباط لوحده بجنيه ونص
ويتأخذ فردة استين

Spread:

- 1- **Direct:** To subcutaneous tissues and the deep fascia.
- 2- **Lymphatic:** By permeation or embolism. Lymphatic permeation leads to satellite nodules around the tumor or between the tumor and the regional lymph nodes. [Transit metastasis]
- 3- **Blood:** Malignant melanoma can spread to any organ. Secondary deposits are usually black.

Differential diagnosis:

- 1- Granuloma.
- 2- Pigmented basal cell carcinoma.
- 3- Hemangioma.
- 4- Compound or junctional nevus.

Pigmented basal cell Carcinoma
Nevus
Granuloma
Hemangioma

حسب مش عاجباه

أنا إيش عرفني هي من دول ولا لا؟؟

أي Benign nevus تقلقل وتخاف

Treatment of LNs

لازم

Breast: staging not radicality

Tongue: 80% incidence

Colon

Stomach

هش لازم

Salivary

Melanoma

lip 10%

Thyroid

* Sentinel LN

the 1st LN to be affected in Axilla in cancer breast

radioactive isotope

تumor في الـ

dye

جوه العملية يحقنوا

و نشوف أول واحدة هنتلون

فيه ناس بتشيها هي دي بس

Investigations:

- ① The only sure method of diagnosis of malignant melanoma is **biopsy & histological examination**.
- The biopsy should include the whole skin & S.C. tissue with safety margin 3mm at least.
- ② **Metastatic work up**: e.g. Chest Xray - U/S Abdomen

Treatment:

- 1- **The primary lesion**: Should be excised with a safety margin 1-3 cm together with the subcutaneous fat but not including the deep fascia. → میش وینستفید لوشلها
- If the tumor thickness $< 1\text{mm}$ → safety margin is 1 cm.
 - If the tumor thickness 1-4mm → safety margin is 2 cm.
 - If the tumor thickness $> 4\text{mm}$ → safety margin is 3 cm.

اعتمادنا علی
Breslow2- **The lymph nodes**: میش لازم

- If the regional lymph nodes are enlarged and firm, a radical block dissection is performed.
- If the lymph nodes are not frankly malignant on clinical examination, fine needle aspiration cytology is performed.
- Prophylactic block dissection is no longer performed.

- 3- **Metastases**: Are treated by chemotherapy, interferon and by interleukin-2.

مهمین جدا



90%

♂

>40y

Basal cell carcinoma

Basal cell carcinoma + LN_s → Chronic non specific infection
→ Basosquamous carcinoma

Squamous cell carcinoma + LN_s → Chronic nonspecific infection
→ Metastasis

Skin & subcutaneous tissue

A.H.

		Basal cell carcinoma (Rodent ulcer) <i>local spread = not lymphatic blood spread</i> This is a <u>locally malignant</u> lesion, which arises from the basal cells of the epidermis or from the <u>equivalent cells</u> of hair follicles and sweat or sebaceous glands.	Squamous cell carcinoma (Epithelioma) Malignant tumor of stratified squamous epithelium
Definition			
Incidence		The disease is more common in males above the age of 40 years. It is the commonest malignant lesion of the skin.	The tumor is more common in <u>males</u> especially <u>old age > 60y</u> persons.
Etiology	S A.H.	S A.H. 1- Prolonged exposure to the ultraviolet rays of the sun 2- Persons with a <u>light-colored complexion</u> are more liable (presence of melanin pigment protects against the effects of ultraviolet rays). 3- Albinism and xeroderma pigmentosa predispose to multiple basal cell carcinomas all over the body.	1- Prolonged exposure to ultraviolet rays of the sun. 2- Previous <u>irradiation</u>. <u>كان زمان بييجي لدكترة الاشعة</u> 3- Albinism and xeroderma pigmentosa. 4- Long standing irritation of the skin as: Chronic ulcers, sinuses, and old burn scars. A carcinoma arising on top of a scar is called <u>Marjolin's ulcer</u>. <u>was first described in posthum</u> <u>better prognosis than S.C. Carcinoma</u> 5- Carcinogenic agents as <u>polycyclic aromatic hydrocarbons</u>, <u>death</u> <u>dermatitis</u> <u>or</u> <u>antimalarials</u>.
Pathology	Size مجم جاد ا شفوى ونظري	90% of the lesions occur in the face especially above a line from the lobule of the ear to the angle of the mouth. The commonest sites are the <u>outer or inner canthus</u> of the eye and the <u>nasolabial fold</u>. 1- The lesion usually starts as a <u>small nodule</u> covered by thin epidermis. The nodule ulcerates after sometimes with serous discharge and bleeding. Healing sometimes occur in one area of the lesion while further ulceration occurs. 2- Later the patient presents by an <u>ulcerated mass</u>. <u>The edge</u>: Is rolled-in and is beaded. <u>رد الزر / فطش</u> <u>Size</u>: Small. <u>عائلا مينو فواتي</u> <u>The floor</u>: Is red <u>granular</u> and often covered with a dry crust <u>قشرة</u>. <u>سودا</u> 3- <u>Excavating type</u>: Where the ulcer <u>erodes</u> deeply into the underlying structures leading to destruction of the nose and infiltration of the nasal sinuses. <u>نجل ست</u> Other less common types include the <u>cystic</u>, the <u>pyogenic</u> (containing melanocytes) or the <u>flat superficial spreading type</u>, which presents as a red scaly patch.	An ulcerated mass (<u>malignant ulcer</u>) <u>Size</u>: Grows rapidly, may reach large size. <u>The edges</u>: Are raised and everted. <u>The floor</u>: Malignant fungating tissue. <u>dark necrotic tissue</u> <u>The base</u>: Is indurated and it becomes rapidly fixed to the underlying tissues. <u>Secondary infection</u>: May occur and there may be blood stained discharge.

Skin & subcutaneous tissue Skin biopsy ريف Clinically ليا ميسا ليا ميسا ليا ميسا

A.H.

	lymphatic	Blood
Carcinoma	✓✓✓	✓
Sarcoma	rare	✓✓✓

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Pathology		In well-differentiated tumors each mass shows the same layers as the normal stratified squamous epithelium with keratin inside and basal cells outside. These cell masses with central keratin are called cell nests (epithelial pearls). Broder's classification is used in squamous cell carcinoma and depends upon the number of cell groups with cell nest appearance:	
Microscopic picture	The tumor cells are arranged so as the outer layer of these groups of cells is composed of low columnar cells arranged side by side like a palisade. Inside this layer the cells are polyhedral with basophilic nuclei. There is a tendency to The stroma shows infiltration by lymphocytes. encephaloid u; = trial of healing	Broder's Classification Grade I: 75-100 % Keratinized groups. Grade II: 50-75 % Keratinized groups Grade III: 25-50 % Keratinized groups Grade IV: 0-25 % Keratinized groups	
	Spread	1- Direct spread: To the surrounding and underlying structures. 2- Lymphatic spread: Does not occur. If the draining lymph nodes are enlarged, this is usually due to secondary infection or the presence of a focus of basosquamous carcinoma. 3- Blood stream spread: Does not occur.	1- Direct spread: The tumor rapidly infiltrates the adjacent structures 2- Lymphatic spread: To the regional lymph nodes. Sometimes the nodes are enlarged as a result of secondary infection. In patients with Marjolin's ulcer, the fibrosis associated with the scarring makes lymphatic dissemination late. 3- Blood stream spread: Is very uncommon.
Differential diagnosis		1- Basal cell carcinoma. (with sq. cell carcinoma)	
system picture		2- Squamous cell carcinoma. (with basal cell carcinoma)	
		3- Malignant melanoma.	
		4- Keratoacanthoma. [Benign]	
		It commonly occurs on the face or hands of elderly people as a cherry-red nodule , which may grow to 2 cm or more in a few weeks. The swelling often ulcerates & may undergo spontaneous healing.	
		Treatment: Surgical excision is recommended to permit adequate histological examination.	
Investigations		1- Diagnosis should be confirmed by a biopsy.	
		If the lesion is small, excision biopsy is performed; otherwise a small piece of the edge with an area of adjacent skin is excised. (incision biopsy)	
		(to detect behavior with surrounding tissue)	

Treatment

Radiotherapy Basal cell carcinoma is very radiosensitive. Contraindicated if there is involvement of an underlying cartilage or bone or if the lesion is near the eyes *أغلب الحالات*

Surgery Is indicated for:

- 1- Small lesions. ← *سما*
- 2- Infiltration of underlying cartilage or bone as
 - a- The bone cells will protect the malignant cells from the effect of radiotherapy.
 - b- Radiation is likely to cause necrosis of the involved bone and cartilage.
- 3- Radio resistant lesions.
- 4- Recurrences after previous irradiation.

no suspicious
marjolin
block dissection

Surgery should include an adequate safety margin $\frac{1}{2}$ cm at least regarding the surface and the depth. The defect created after excision can be closed by primary suture or by various plastic rotational flaps. The pathologist should check that an adequate safety free margin has been excised, and if not, revisional surgery or radiotherapy should be applied.

Other possible lines for treatment include cryosurgery and local application of cytotoxic drugs as 5-fluorouracil ointment.

The prognosis: Excellent and provided that the lesion has been excised completely, the cure rate is 100 %. Recurrence of the lesion is due to leaving behind foci of malignant tissue and this is more liable to occur if there is infiltration of bone or cartilage. *قوة*

Two modalities of treatment are available.

Surgery Is indicated for:

- 1- Small lesions are treated by excision biopsy with an adequate safety margin.
- 2- Infiltration of cartilage or bone.
- 3- Radioresistant lesions.
- 4- Recurrences after previous radiotherapy.
- 5- Marjolin's ulcer [The safety margin for epithelioma is at least 2 cm except in the face where it is 0.5 inch. *1.25 cm*]
- 6- Block dissection of metastatic lymph nodes.

no lymph node affected ← Basal cell *ميتعش في*

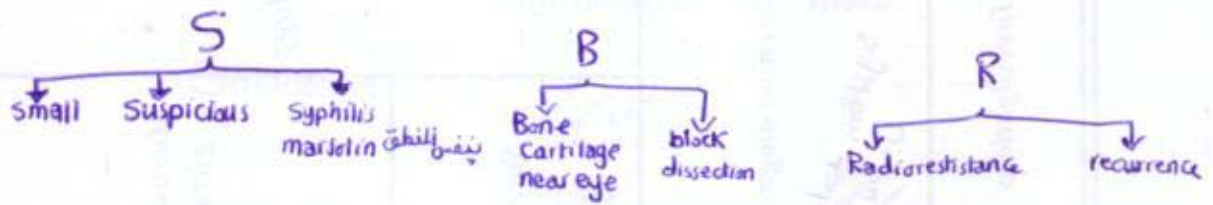
Radiotherapy The main indication of radiotherapy is for tumors of the head and neck particularly for poorly differentiated lesions.

Prognosis: 90 % five years cure rate. *رائع*

~~Indications for surgery~~

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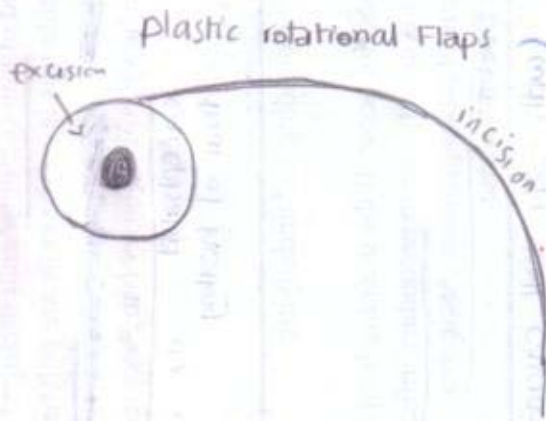
* Indications for surgery



* ليه Radiotherapy مينفعش في Syphilis ولا mardolin

أي Malignancy عايش على التغذية فلما يتا blood supply ع يموت

لكن في Syphilis أصلاً blood supply قليل فلما يقل كمان مش فارقة كثير هيكمل



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